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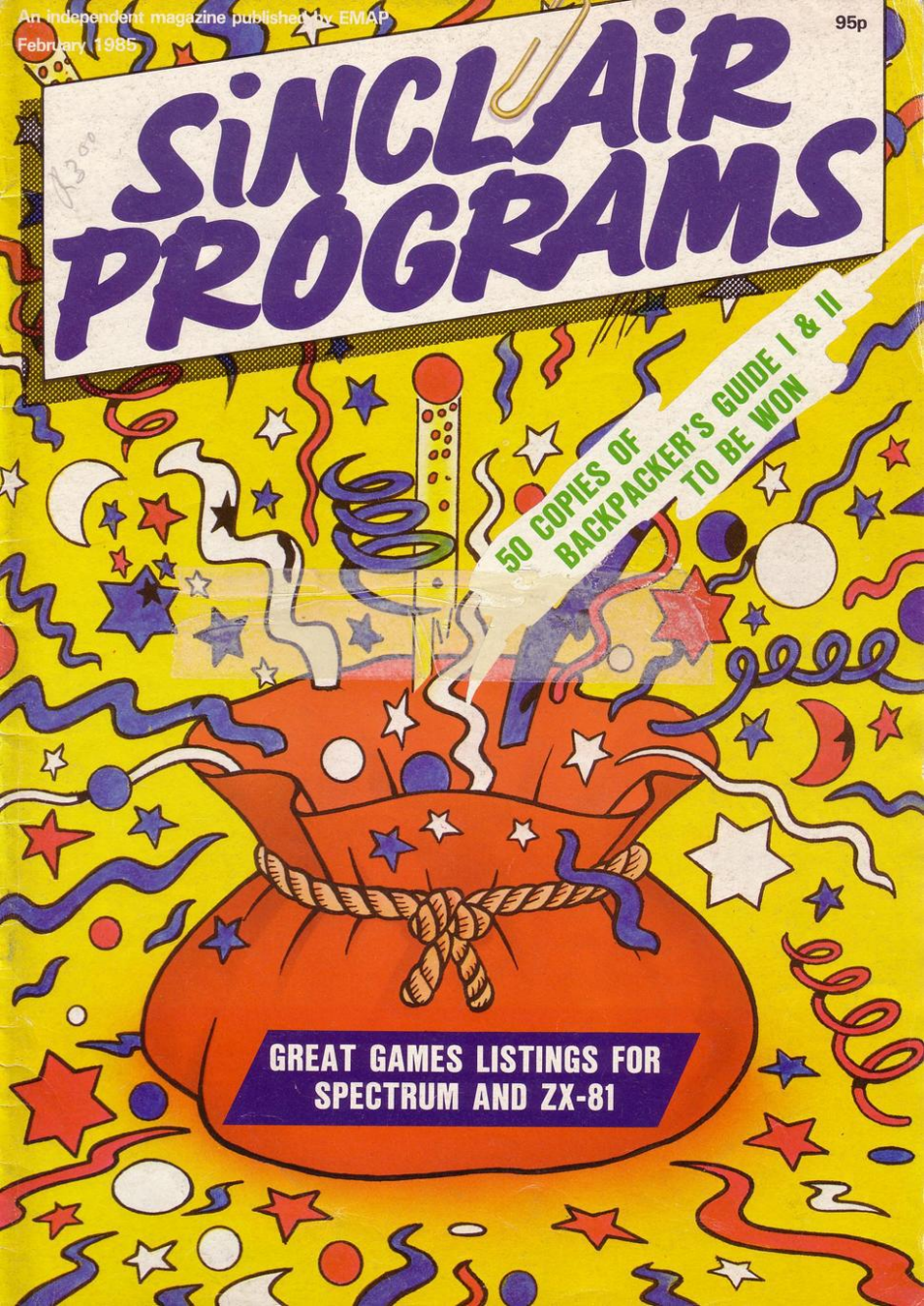

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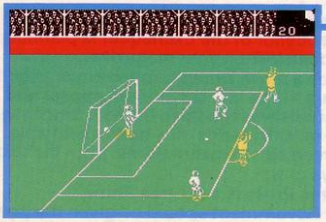

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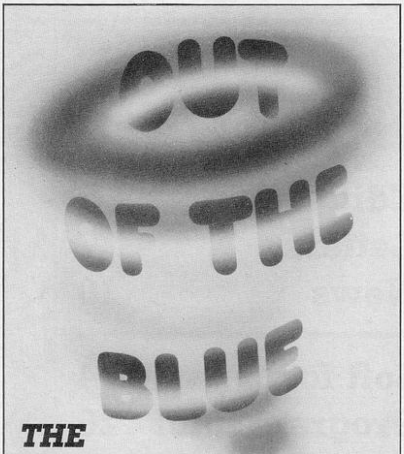
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A GREAT free poster, stickers and a badge. What more could you expect from a jamboree bag? Well, there is even more. We will be awarding a prize of all the software reviewed in *Soft Focus* this month, to the reader who finds the most unusual place to stick their *Sinclair Programs* stickers.

Stick them on cassettes, stick them on books, stick them in your room, but also try them in other places. Can you get your stickers air borne, send them under water without getting them wet, set them moving at a hundred miles an hour? The possibilities are endless.

For a chance at the prize, let us know before the end of February where you stuck your stickers. The best ideas will be published on our letters page and, if you enclose a clear black and white photograph, we may be able to publish that as well.

At the same time, why not enter our Chartline competition? Remember, the more votes we have, the more accurate the chart is, and every entrant is eligible to win the prize. Let us know your favourite game, and the game you hate the most. Do you agree with this month's chart? Does it represent your views? Let us know, we are waiting to hear from you.

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Priory Court, 30–32 Farringdon Lane,
London EC1

Programs should be on cassette. We cannot undertake to return them unless a stamped, addressed envelope is included. We pay £25 for the copyright of listings published and £10 for the copyright of listings published in the Beginners' section.

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Cover Illustration—Ivan Hissey

Instructions for graphics characters are printed in lower-case letters in our listings. They are enclosed by brackets and separated by colons to distinguish them and the brackets and colons should not be entered.

Inverse characters are represented by the letter "i" and graphics characters by "g". Thus an inverse W would be represented by "iw", a graphics W by "gw", and an inverse graphics W by "igw".

Spaces are represented by "sp" and inverse spaces by "isp". Whenever any character is to be used more than once, the number of times it is to be used is shown before it, together with a multiplication sign. Thus "6*isp" means six inverse spaces and "(g4:4*i4:g3)" would be entered as a graphic four, followed by an inverse four repeated four times, followed by a graphics three.

Where whole words are to be written in inverse letters they appear in the listings as lower-case letters. Letters to be entered in graphics mode on the Spectrum are underlined.

Inverse characters may be entered on the ZX-81 by changing to graphics mode and then typing the appropriate characters and on the Spectrum by changing to inverse video and typing the appropriate letters. Graphics characters may be entered on the ZX-81 by changing to graphics mode and then pressing symbol shift while the appropriate characters are entered. On the Spectrum graphics characters may be obtained by changing to graphics mode and then pressing the appropriate character. User-defined graphics will appear as normal letters until the program has been RUN.

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LETTERS

Send your thoughts to us at Letters, Sinclair Programs, 67 Clerkenwell Road, London EC1R 5BH. We pay £2 for every letter published.

I HAVE scored 232,399 on day one of **Daley Thompson's Decathlon.** I jumped the long jump five times. I managed to score 8.52 seconds on the 100m, 9.01m on the long jump, 26.51m on the shot putt, 4.04m on the high jump, and 30.6 seconds on the 400m.

On day two I have scored 397,300. I ran the 110m hurdles in 9.89 seconds, jumped 5.04m in the pole vault, threw the discus 76m, and ran the 1500m in 272.98 seconds.

Although my scores are not brilliant, during a different game I managed to throw the javelin 117 metres, but in the process broke my Quickshot II joystick.

I thought this was excellent, because nobody I know can throw more than 99m. If anybody can better my achievement, please write to *Sinclair Programs.*

Hurry, though, my fingers are getting faster all the time.

S Jay,
Fildon, Bristol.

First is second

AS SOON as I saw the advert for **Rocket Man** I rushed to the shops and bought it. After the shock of the astounding graphics, I gradually got the hang of it. After many weeks of desperation due to that cursed bubloid I managed to score a personal best of 919,859. I would like to know whether anyone has beaten my score.

Nick Morgan,
Edinburgh.

● *No sooner said than done . . .*

Second is first

WE ARE writing to tell you that we have been playing **Rocket Man** since it was released, and we have beaten Simon Kelly's score of 48,398. We scored 1,642,200. We could have scored a lot more but the program crashed. When we reached that score we have 17 men left. We take it in turns to play, playing alternate levels. We would like to know anyone who has beaten this score, as it is measly.

Frank & Tom,
Levn, Fife.

IN reference to the letter published in the November issue of *Sinclair Programs* about the highest score on the program **Cash Accumulator.**

James Williamson claimed to have beaten the score of sixteen million. On my first go I scored 36,279,714.

I should like to hear from anyone who has beaten my score.

Gil Ben-Horing,
Golders Green,
London.

Pen-pal required

I AM writing to say that your magazine is great, but it would be better if more ZX-81 games were published.

The main reason for this letter is that I would like a pen friend in the Stoke-on-Trent or Staffordshire area to exchange listings, information and ideas. If you are interested, you must own a ZX-81, and have a great interest in computers.

Write to:

Darren Lovatt,
33 Neath Close,
Weston Park,
Longton,
Staffordshire.

Learnt from a book

I SHOULD like to find some pen-pals who own Spectrums. I own a Spectrum 48K. As I have never been taught to use a computer I have had to teach myself programming from a book. I should like to communicate with anyone of any age to swap listings and hints. Very often what one person finds a problem can be quite simple to anyone else.

I enjoy playing commercial games, as well as writing my own programs, although I have so far had little success in this field.

If you are interested, please write to me.

David Duffill,
30 Heston Avenue,
Great Barr,
Birmingham.

Bugged invaders

I AM writing to tell you about a bug in a game called **Invasion Force,** produced by Artic Computing.

The game is good, with excellent graphics on a 16K ZX-81. The bug takes effect when you have scored more the 874,000. The game then ends straight away, even if you have several lives remaining. Your score decreases rapidly, the screen shows that you have been destroyed, and your name will no longer be accepted by the program.

Has any other player found this problem?

Garry Heather,
Reading, Berkshire.

Please complete this form and enclose it with any program which you send to us for possible publication.

To: Sinclair Programs, 67 Clerkenwell Road, London EC1R 5BH.

I enclose .....Program(s) for the ..... computer.
I guarantee that each program submitted is my original work.

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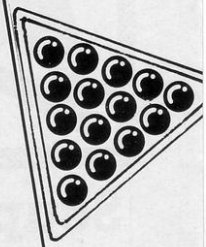
POTABALL

FANCY a game of Snooker on your 16K ZX-81? Then try Potaball, written by Dennis Wood of Kimmel Bay, Rhyl.

Once the table has been displayed, you will be asked to choose your cue stroke and the obj ball angle. The cue stroke is based on the y co-ordinate of the object, and should be between 3 and 23, while the obj ball angle is based on the x co-ordinate and should be between 3 and 11.

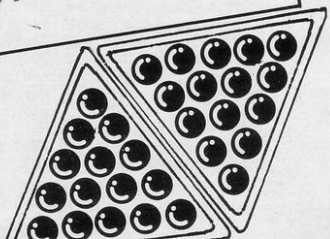
Pot a red and then a colour, repeating the process until only colours remain, when they can be potted in any order. Play your best, because the computer plays extremely well.

```
1 SLOW
2 DIM A(22)
3 DIM D(22)
4 LET V=4
5 FOR F=1 TO 7
8 LET N=16
10 LET A(F)=21
11 LET D(F)=V
12 LET V=V+1
15 NEXT F
16 LET V=5
20 FOR F=8 TO 12
23 LET A(F)=20
24 LET D(F)=V
25 LET V=V+1
26 NEXT F
27 LET V=6
28 FOR F=13 TO 15
29 LET D(F)=V
30 LET A(F)=19
31 LET V=V+1
32 NEXT F
33 LET RED=0
34 FOR F=16 TO 19
36 LET D(F)=7
37 LET A(16)=18
38 LET D(16)=7
40 NEXT F
42 GOSUB 7000
50 DIM P(6)
51 DIM O(6)
52 GOSUB 8000
53 LET S=16
54 LET M=0
55 LET J=73
57 LET MO=1
58 LET A$="Y"
59 LET Z=0
60 LET REDS=0
61 LET MOVE=73
65 LET WBD=6
66 LET WBA=3
67 GOSUB 1000
68 GOSUB 6014
69 LET D=WBD
70 LET A=WBA
73 PRINT AT 21,0;"                CUE
STROKE
74 INPUT WBA
76 IF WBA<3 OR WBA>23 THEN GOT
O 73
77 PRINT AT 21,0;"                OBJ BA
LL ANGLE
78 INPUT WBD
79 LET MOVE=6020
81 IF WBD<3 OR WBD>11 THEN GOT
O 77
82 PRINT AT 21,0;" POCKET
83 INPUT P
84 IF P<1 OR P>6 THEN GOTO 82
85 GOSUB 2080
86 GOTO 4000
94 GOSUB 1000
100 GOTO J
1004 FOR F=2 TO 24
1005 PRINT AT 2,F;"▒";AT 12,F;"▒
"
1010 NEXT F
1015 FOR F=3 TO 11
1020 PRINT AT F,2;"▒
";AT F,24;"▒"
1025 NEXT F
1030 PRINT AT 0,10;"POTABALL"
1035 PRINT AT 2,2;" ";AT 2,13;"
";AT 2,24;" ";AT 12,2;" ";AT 12,
13;" ";AT 12,24;" "
1036 PRINT AT 1,2;"1";AT 1,13;"2
";AT 1,24;"3";AT 13,2;"4";AT 13,
13;"5";AT 13,24;"6"
1037 PRINT AT 5,5;"■";AT 7,5;"■"
;AT 9,5;"■";AT 7,13;"■";AT 7,16;
"■";AT 7,22;"■"
1040 PRINT AT 15,3;"YOUR SCORE";
RED;AT 17,3;"ZX81 SCORE";REDS
1041 FOR F=1 TO S
1042 PRINT AT D(F),A(F);"O"
1043 NEXT F
1048 PRINT AT D(17),A(17);"B"
1050 PRINT AT D(18),A(18);"L"
1053 PRINT AT D(19),A(19);"A"
1054 PRINT AT D(20),A(20);"Y"
1055 PRINT AT D(21),A(21);"G"
1056 PRINT AT D(22),A(22);"P"
1057 PRINT AT WBD,WBA;"O"
1058 PRINT AT 1,27;"CUES"
1060 FOR F=3 TO 15
1065 PRINT AT F,27;"▌ ▌"
1066 NEXT F
1068 RETURN
2081 FOR F=1 TO S
2082 IF WBD=D(F) AND WBA=A(F) TH
EN GOTO 3004
2084 NEXT F
2085 FOR F=17 TO 22
2086 IF WBD=D(F) AND WBA=A(F) TH
EN GOTO 7085
2087 NEXT F
3003 RETURN
3004 PRINT AT 21,0;"                POTT
ED"
3006 GOSUB 6050
3007 IF J=6020 THEN LET REDS=RED
S+1
3008 IF J=73 THEN LET RED=RED+1
3009 IF J=6020 THEN LET Z=1
3011 LET S=S-1
3014 LET A(F)=O(P)
3015 LET D(F)=P(P)
3016 LET M=1
3018 GOSUB 5000
3020 GOTO 90
4005 PRINT AT 21,0;"                MISS
ED"
4006 IF MOVE=6020 THEN LET J=602
0
4007 IF MOVE=73 THEN LET J=73
4015 GOSUB 5000
4050 GOTO 90
5000 PRINT AT D,A;"■";AT WBD,WBA
;"O"
5001 IF M=1 THEN PRINT AT D(F),A
(F);"O"
5002 LET M=0
5003 GOSUB 8030
5016 IF S=0 THEN GOSUB 7000
```



POTABALL

```
5017 FOR F=17 TO 22
5018 IF S>0 THEN GOSUB 7050
5019 NEXT F
5020 FOR F=1 TO 22
5035 IF WBD=D(F) AND WBA=A(F) TH
EN GOSUB 6000
5036 LET D=WBD
5037 LET A=WBA
5040 NEXT F
5045 RETURN
6000 LET WBA=INT (RND*21)+3
6005 LET WBD=INT (RND*9)+3
6010 RETURN
6016 PRINT AT 21,0;" DO YOU WANT
 TO BREAK Y/N"
6017 INPUT A$
6018 IF A$="Y" THEN RETURN
6021 LET MOVE=73
6022 LET P=INT (RND*6)+1
6023 IF Z=1 OR S<=0 THEN GOTO 60
35
6024 LET D=WBD
6025 LET A=WBA
6026 LET X=INT (RND*16)+1
6027 LET WBA=A(X)
6029 LET WBD=D(X)
6032 IF WBD<3 OR WBD>11 OR WBA<3
 OR WBA>23 THEN GOTO 9000
6033 GOSUB 9900
6034 GOTO 85
6037 LET X=INT (RND*5)+17
6038 LET WBA=A(X)
6039 LET WBD=D(X)
6040 IF WBD<3 OR WBD>11 OR WBA<3
 OR WBA>23 THEN GOTO 9000
6041 LET P=INT (RND*6)+1
6042 LET Z=0
6044 GOSUB 9900
6045 GOTO 85
6050 IF MOVE=6020 THEN LET J=73
6055 IF MOVE=73 THEN LET J=6020
6058 RETURN
7000 LET A(17)=22
7002 LET D(17)=7
7003 LET D(18)=7
7004 LET A(18)=13
7005 LET A(19)=5
7006 LET A(21)=5
7007 LET A(20)=5
7008 LET D(20)=5
7009 LET D(21)=9
7010 LET D(19)=7
7015 LET A(22)=16
7016 LET D(22)=7
7020 RETURN
7050 LET A(F)=INT (RND*21)+3
7055 LET D(F)=INT (RND*9)+3
7060 RETURN
7070 FOR F=17 TO 22
7072 IF WBD=D(F) AND WBA=A(F) TH
EN GOTO 7085
7074 NEXT F
7084 RETURN
7085 IF S<=0 THEN LET S=S-1
7086 PRINT AT 21,0;"POTT
ED"
7087 GOSUB 6050
7089 IF J=6020 THEN LET REDS=RED
S+(7 AND WBA=A(17) AND WBD=D(17)
)+(6 AND WBA=A(18) AND WBD=D(18)
)+(5 AND WBA=A(19) AND WBD=D(19)
)+(4 AND WBA=A(20) AND WBD=D(20)
)+(3 AND WBA=A(21) AND WBD=D(21)
)+(2 AND WBA=A(22) AND WBD=D(22)
)
7090 IF J=73 THEN LET RED=RED+(7
 AND WBA=A(17) AND WBD=D(17))+(6
 AND WBA=A(18) AND WBD=D(18))+(5
 AND WBA=A(19) AND WBD=D(19))+(4
 AND WBA=A(20) AND WBD=D(20))+(3
 AND WBA=A(21) AND WBD=D(21))+(2
 AND WBA=A(22) AND WBD=D(22))
7092 IF S=-6 THEN PRINT AT 7,8;"
FRAME OVER";AT 8,8;("ZX81 WINS"
AND REDS>RED)+("YOU WIN" AND RED
>REDS)
7093 IF S=-6 THEN STOP
7094 LET M=1
7095 LET A(F)=O(P)
7096 LET A(F)=O(P)
7097 LET D(F)=P(P)
7098 GOSUB 5000
7099 GOTO 90
8002 FOR F=1 TO 3
8003 LET P(F)=2
8004 NEXT F
8005 FOR F=4 TO 6
8006 LET P(F)=12
8007 NEXT F
8008 LET O(1)=2
8009 LET O(2)=13
8010 LET O(3)=24
8011 LET O(4)=2
8012 LET O(5)=13
8017 LET O(6)=24
8020 RETURN
8030 FOR F=1 TO S
8032 LET D(F)=INT (RND*9)+3
8034 LET A(F)=INT (RND*21)+3
8036 NEXT F
8038 LET MO=0
8040 RETURN
8055 LET R=INT (RND*22)+1
8057 IF R=1 THEN LET WBA=O(P)
8059 IF R=1 THEN LET WBD=P(P)
8061 IF R<>1 THEN RETURN
8063 LET FOUL=FOUL+4
8065 PRINT AT 21,0;"IN O
FF"
8066 GOSUB 6050
8068 GOSUB 5000
8070 GOTO 9015
9000 PRINT AT 21,0;"I WENT IN
OFF"
9005 FOR F=1 TO 25
9006 PRINT AT P(P),O(P);"O";AT D
,A;"■"
9010 NEXT F
9025 IF MOVE=73 THEN LET J=73
9030 IF MOVE=6020 THEN LET J=602
0
9035 FOR F=1 TO 25
9036 PRINT AT P(P),O(P);" "
9037 NEXT F
9038 LET WBA=5
9039 LET WBD=6
9040 PRINT AT WBD,WBA;"O"
9045 GOTO 69
9900 LET B$=("PINK" AND X=22)+(
"GREEN" AND X=21)+("YELLOW" AN
D X=20)+("BROWN" AND X=19)+("R
ED" AND X<=16)+("BLACK" AND X=1
7)+("BLUE" AND X=18)
9905 PRINT AT 21,0;"I WILL TRY F
OR A";B$;"
9910 FOR F=1 TO 25
9915 NEXT F
9920 RETURN
9999 SAVE "POTABALL"
```



NEWS

Scuppered!

SOFTWARE pirates are estimated to cost the software industry £150 million every year. A private member's bill designed to strike terror into pirates' hearts and put an end to this situation recently had its first reading in the House of Commons.

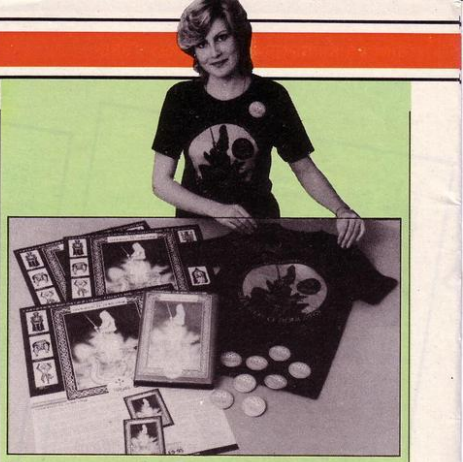
The bill was proposed by Conservative MP, William Powell and has the full support of the Federation Against Software Theft (FAST). FAST was formed in July last year to strengthen the copyright law, and its members include Sinclair Research, Smiths, IBM, and major traders.

Powell, MP for Corby, feels that the bill should gain support from all parties as it "is non-contentious in its nature and has an excellent chance of becoming law". If the bill does gain support at its first, second and third readings, it will mean that the copyright laws are strengthened considerably, and there will be clear grounds on which offenders can be charged.

Plus: more additions

THE NEW Kempston Extender cable will prove a great help to Spectrum Plus owners. Sinclair Research earned themselves a black mark when it was found that the Kempston interface linking the Spectrum with the Kempston Joystick could not be attached to the supposedly fully compatible Spectrum Plus.

The new cable runs from interface to computer, and will be on sale in Boots, John Menzies and other retail outlets at a cost of £7.95. Said Keith Archer, Kempston's Technical Adviser, "We had thought of producing an extender cable and, after the arrival of the Spectrum+, we were prompted into action."



Lots of monsters: even more insults

SWORDS and Sorcery was recently released by PSS for the Spectrum along with a range of accessories including t-shirts, badges and posters. Programmer Mike Simpson spent eighteen months on the program which numbers Real Time, 86 monsters, 2,000 objects and four million ways to be insulted among its features. Packaged in a ring binder complete with explanatory booklet, **Swords and Sorcery** will retail at £9.95.

Short on plus

ALTHOUGH Sinclair Research had predicted record Christmas computer sales it was not prepared and was faced with a shortage of Spectrum Pluses. The increased interest in the Spectrum+ following an extensive advertising campaign and the keyboard problems soon took its toll. This did not knock Sinclair's confidence and it was predicting that the shortages would soon be overcome.

The Spectrum+ may have been thin on the ground but the 48K Spectrum was still readily available. This was proved when Sinclair Research donated three computers as prizes to winning entrants in a Save the Children Calendar competition.

Dummies study Sinclair TV

FANS of Sir Clive Sinclair will soon be able to see their hero on display at Madame Tussauds. A waxwork model of Sir Clive has already been completed but he cannot be unveiled until a model of Selina Scott has been finished. The pair will star together with Sir Clive holding a Sinclair pocket TV and Selina glancing over his shoulder at the screen.

Frankie goes soft with Ocean

ISLAND Records, the recording company for **Frankie Goes to Hollywood,** has joined forces with Ocean Software and the Zang Tumb Tuum (ZTT) organisation. The results will be available for Spectrum and Commodore 64 owners to see in the spring when the first Frankie game is launched. The ZTT organisation are the band's creative producers and their contributions to the game should make it as individual as the band's music. Royalties from the sales will go to Frankie Goes to Hollywood and the three companies will share the revenue from the adventure game.

SINCLAIR PROGRAMS

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The consequence of this would not only be that magazines would become more expensive, but that there would be fewer magazines on sale. If a magazine's price rise were substantial, fewer people would buy the magazine. As publishers will make no money from the price rise, smaller magazines will lose money, and will be forced to close.

Younger people will pay more taxes, magazine prices will rise, and there will be fewer magazines on sale. Do you want this to happen? Write to your MP, or persuade your parents to do so, explaining what you think of this proposal.

Wizard

LOOKING for the follow-ups to **Monty Mole** and **Potty Pigeon?** Check out the Quicksilva titles, then, rather than the Gremlin stocks, for Quicksilva have gained world-exclusive rights on the next two games from their author, Tony Crowther.

Wizard Development Company run by Tony and his partner, Roger Taylor, is pleased about the alliance because it gives Wizard the experience and good name of one of the leading British software companies.

The two games, **Black Thunder** and **Gryphon,** have been written for the Commodore 64 but a spokeswoman for Quicksilva confirmed that their successful games are converted from Commodore to Spectrum and so conversion is likely to start early next year.

New Generation magic

LIGHT MAGIC, a recent release from New Generation Software, is their first offering which has not been produced in-house. The graphics package was bought from a freelancer and New Generation feel that it will appeal to the more serious Sinclair users. The Light Magic program follows on from **Machine Code Tutor** which New Generation launched in the middle of 1984.

James Day, the programmer who is adapting the Commodore version of **Cliff Hanger** has now left New Generation to go to university. Although he will still work on a freelance basis, New Generation are seeking full-time programmers.

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Each glass has a RUNIC inscription around its base which you must read and understand. Only saying these words will lift that part of the spell. To protect the hour glasses Zendos has placed them in 12 separate rooms in his castle, each room linked to a different exterior gateway by a devious route.

Depending on which entrance you select Zendos casts spells which change the locations of rooms within his castle to confuse you. The menacing creatures and challenging problems which confront you at every turn mean that only the brave and the clever will succeed.

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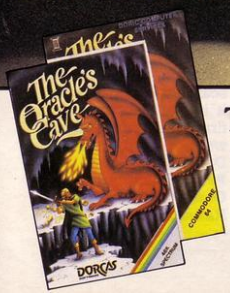

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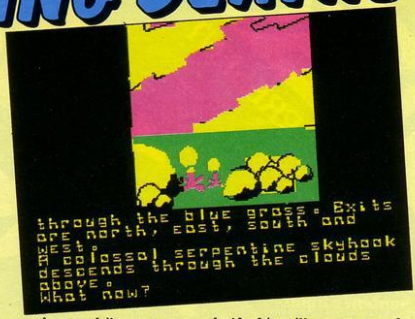
DIE AGONISING DEATHS

RETURN TO EDEN

ADVENTURE game enthusiasts are bound to have tales of dangerous and inescapable situations in which they have been caught. The plight of Kim Kimberley in **Return to Eden** must win some sort of prize for being absolutely the worst situation in which anybody could find themselves. Even if we forget that Kim has just emerged from the earlier Level 9 adventure **Snowball,** and if we take into account that if we were Kim we would be able to see around us and thus avoid trying eight directions and in, out, up and down in all locations, the situation does not improve.

There Kim is, unprotected, in the wreckage of a stratoglider lifeboat. In a limited amount of time a spaceship's rockets will be turned on Kim, and she has no hope of survival unless she can overcome two puzzles, untangle a maze and find one specific location before the rockets are switched on. If this game was for real, Kim would probably be fried while exploring the lifeboat.

Level Nine adventures are always outstanding, and Return to Eden is a joy to play. Quickly-drawn pictures are optional, and it is possible to change from text-only adventure to text and graphics at any point. All input receives a sensible answer, and it is by no means always the same answer. Even pressing every key, one after another, while not producing the same useful results as this did in Snowball, will elicit a wide variety of responses.



Perhaps most user-friendly of all is the program's text acceptance. On most adventures the program will deal with one piece of text, ponder it at length, and then print a response. If you have already started typing your next move, only half of it will appear and this must either be edited or entered. Return from Eden will deal with an enormous number of phrases at one time. Typing in eleven instructions in close succession will not confuse it at all.

An excellent, user-friendly, fiendishly difficult adventure, Return to Eden is produced by Level 9 computing.

Game type: Adventure
Rating: 90%

BEAM RIDER

FEELING mentally exhausted by a surfeit of adventure games? Fingers itching to kill something? Looking for a game which brings the electronic slaughter of the arcades into your home? You are? Strange.

Beam rider sets you flying through fifteen levels of grids, on each of which you have fifteen ships to blast into oblivion. This starts off fairly easy but, as the levels progress, the screens become littered with space debris, unassailable ships and all sorts of dangerous objects.

The graphics are not amazing, in fact they are small and pathetic. The speed of everything is very fast, so fast that you are likely to leave the game after an hour or so with a severe case of eye strain, and twitching fingers.

It is fast, it is furious, but it is not original, and it does not even approach excitement. Arcade freaks may find it appealing, no one else will.

Beam rider is produced by Activision, 15 Harley House, Marylebone Road, London NW1.

Price: £7.99
Game type: Arcade
Rating: 35

LAZY JONES

WHERE do old arcade games go to die? The answer is that they retire to **Lazy Jones** where they shrivel away to nothing and lose any charm that they ever possessed.

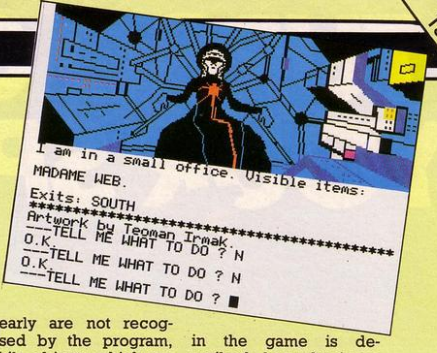
Lazy Jones is the eponymous hero of this game, and he finds himself in a three storey building full of doors, with lethal characters running up and down each floor, and slow-moving lifts connecting the storeys. The corridors, though, are an incidental part of the game. Behind the doors, always providing that you do not accidentally visit the broom cupboard or the toilet, are miniature versions of all the old favourite arcade games.

Space invaders, Frogger and **Breakout** can all be played on a miniature screen, against the clock, with no high score option, very limited sound and graphics and no replay option. If these games were not dying before, Lazy Jones kills them quickly and efficiently. By the time the third room is reached you will be keeping your finger on the fire button while you stare out of the window.

Given the nature of the program, it seems scarcely surprising that it is manufactured by a firm called Terminal Software, Derby House, Derby Street, Bury.

Price: £6.95
Game type: arcade
Rating: 15%

QUESTPROBE



SUPER powers may be useful in many circumstances, but they certainly make adventure games no easier to solve. **Questprobe** stars the player in the role of Spiderman, continuing the adventure depicted in the Marvel comic supplied with the game. With super strength, the ability to climb walls and Spiderman's many other powers, things should be relatively easy but, in point of fact, it is difficult to remember what your new-found powers are, let alone where and when to use them.

Spider strength soon comes in useful as you attempt to leave your start location by way of the lift. The ability to climb walls is less immediately useful, things seem to look just the same from the wall as from the floor.

The graphics of the adventure are superb, the Marvel comic characters such as the Sandman, Hydroman and the Ringmaster appear in full colour immediately you enter a location. Despite the quality of the graphics, they do not appear to be overly useful. Objects you can see quite clearly are not recognised by the program, while objects which are described as soon as you examine a location are not visible in the pictures.

The adventure itself is excellent, with enough puzzles appearing immediately to keep any adventurer involved and intrigued. One slight problem lies with the instructions. Your object in the game is described, but why is no mention made of the gems which can be collected, what they are, and what is to be done with them?

Questprobe is produced for the 48K Spectrum by Adventure International.
Price: £9.95
Game type: Adventure
Rating: 70%

PITFALL 2

SOMEHOW there is more disappointment in encountering a bad game with a misleadingly good write-up on the cassette sleeve than there is in simply encountering a bad game. **Pitfall 2** sounds very promising. Vampire bats, poisonous frogs and deadly electric eels all sound exciting and challenging.

In point of fact, the game is not much fun. The frogs are OK, although they hardly move. The scorpions have all the convincingly animated reality of a picture being dragged along the ground, and the bats are little more than shapeless blobs recognisable as bats only because they move around in the air rather than on the ground.

Your aim is to move around the underground caverns, collecting the gold bullion in order to gain points, and finally collecting the Raj diamond. Some of the graphics are good, for example the underground rivers and waterfalls. Scrolling from screen to screen is not smooth, but performed in a series of jerky steps.

Pitfall 2 is produced for the 48K Spectrum by Activision.
Game type: Arcade
Rating: 35%

LODE RUNNER

IF YOU thought the days of itsy-bitsy characters in games were long gone, you were wrong. If you thought tiny characters were a sign of a bad game you were even further from the truth. **Lode Runner,** from Software Projects, features several tiny characters running across the screen or, rather, running across 150 screens.

Your aim is to collect all the gold on one screen and then escape to the next screen. Your enemies, who chase you commando-style across the screen, aim to stop you. Their touch means instant death and, what is more, they have a nasty habit of picking up the gold you want to collect.

The basic idea behind the game is very familiar. Climb the ladders, collect the objects, avoid your enemies, and dig holes for them to fall into. Several points, though, differentiate it from a run-of-the-mill, seen-it-before game.

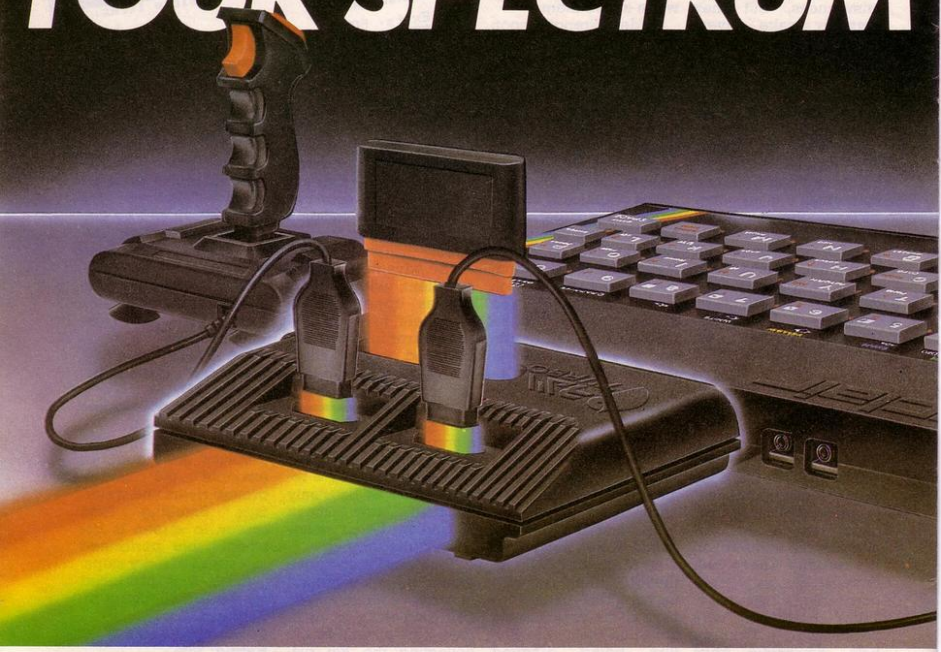
Firstly, there is the sheer number and variety of the screens. 75 on one side of the cassette, and a further 75 on the next. Each contains an ingenious and challenging combination of ladders to climb, poles to slide along and different types of flooring.

Secondly, there is the edit facility. This allows you to change any of the screens, adding ladders, poles, gold, enemies, or whatever you want, to change the whole atmosphere of the game. You can also move the screens around, place all the easy ones at the beginning, or the difficult ones where you can practise them.

The screens are ingenious and the game is fun. However, with excellent graphics proving to be one of the chief selling points of this year's games, and with the Digger theme almost done to death, it does not have the strong attraction of similar games, such as **Chuckie Egg,** released a year ago.

Produced for the 48K Spectrum by Software Projects, Bear Brand Complex, Allerton Road, Woolton, Liverpool.
Price: £9.95
Game type: Arcade
Rating: 60%

TURBO CHARGE YOUR SPECTRUM



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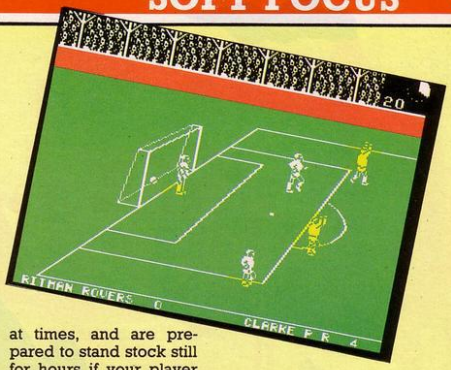
MATCH DAY

MAJOR advantages of football are that those playing it benefit from outdoor exercise, and those watching it have the chance to see skilful players in action. Both of these elements are missing from **Match Day**, a simulation of football on the 48K Spectrum.

The opposition have a clear advantage in that they always know who they are and that they usually know what they are doing. The player is likely to be overtaken by a major bout of schizophrenia as control shifts from one player to the next. The player to move is the one whose socks are white, rather than yellow. As control changes frequently from one character to the next, there are around six players wearing yellow or white on the screen at any one time, and there is no certainty that your player is always on screen, this makes matters a trifle confusing.

A first attempt revealed a rather erratic scoring policy. The opposition were leading 1:0 when, presumably to give amateurs a sporting chance, they scored an own goal. Half time came, seeing the score standing at 4:1, and half time ended, leaving the score at 4:2. Something was definitely wrong somewhere.

The opposition mark your player wonderfully, even blending into him at times, and are prepared to stand stock still for hours if your player chooses to do so. They are also uncomplaining, for repeated kicking of players will never result in a foul being declared.



Football is not, and will never be, intended to be played on the computer. Go outside if you want a good game of football, look elsewhere if you want an enjoyable computer game.

Match Day is produced by Ocean Software, 6 Central Street, Manchester.

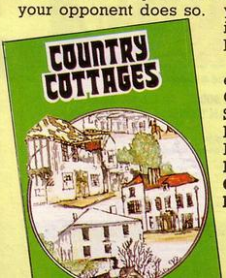
Price: £5.90
Game type: simulation
Rating: 50%

COUNTRY COTTAGES

TOY MONEY is easily spent, and easily lost. Few games have the success of **Monopoly** in persuading each player to cling desperately to every fake pound. **Country Cottages** fails completely. The money you use in it, apart from being intangible and unreal, is also supposed to come from a bank loan. None of these points gives any incentive to spend the money sensibly, or to worry if it is all lost.

Starting with a bank loan, your aim is to buy, rent and sell cottages in order to make a certain amount of money before your opponent does so. Cottages are portrayed so that you can choose whether or not to buy them, potential tenants—almost all of whom seem to be young and to have had children exceptionally quickly—are described for you to accept or decline.

The risks of the game are not particularly great. Tenants may run off unexpectedly, leaving the house in a mess but, on the whole, they are content to remain in your cottages, suffering the odd minor burglary and paying exorbitantly high rents until you have made as much money as you wish. Houses burning down may be a risk, but it is not a great one.



A stolid and uninteresting game, Country Cottages is produced by Sterling Software, PO Box 839, 86-88 Edgware Road, London W2.

Price: £5.95
Game type: simulation
Rating: 25%

SYSTEM 15000

COMPUTER hacking, that is, using your computer to break into other computerised data bases for fun is a hobby of dubious morality and legality. It is, however, very popular, presenting opportunities, as it does, to break codes, find out secret information and baffle security systems. It is an occupation which you either love or hate, hackers will stay up all night once they have started, while observers if any, watch with puzzled surprise.

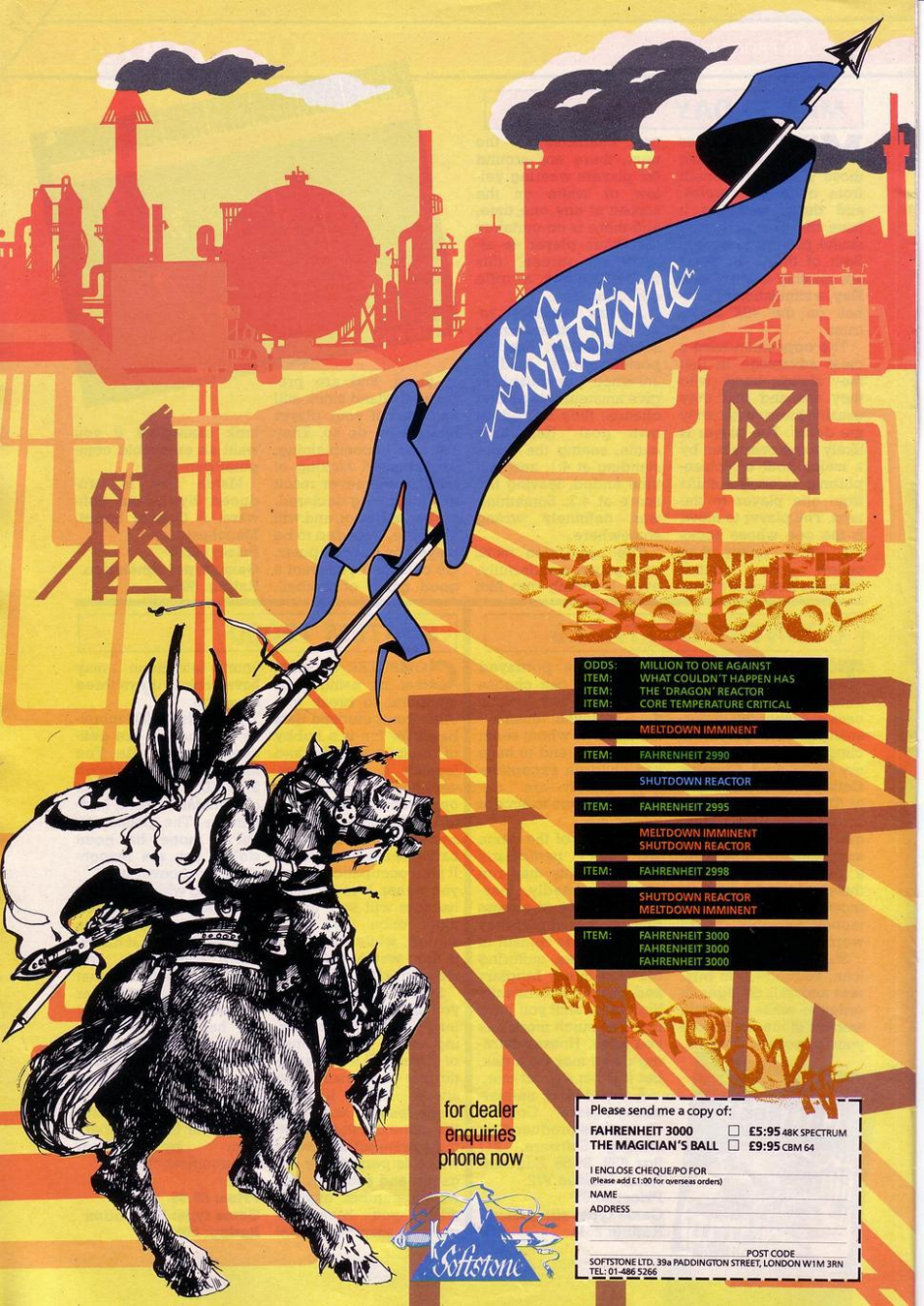
System 15000 gives you all the fun and challenge of computer hacking within the confines of a game. It is so realistic that purchasers who always found hacking uninteresting will find the game about as exciting as ringing a number which is perpetually engaged and probably the wrong number anyway when you have the strong suspicion that your telephone may have broken down three days ago.

In System 15000 morality and the law are definitely on your side. You have to return a stolen $1,500,000 to the account of Comdata's bank, Midminster. The police admit the money has been stolen, you are responsible for recovering it.

Starting with very limited information, which will allow you access to a few facts stored at Kingsdown Polytechnic, and with the knowledge that a scientific researcher named Geoff may or may not help you, you are thrown in the deep end and left to hack your way through as many databases as possible.

System 15000 is produced for the 48K Spectrum by Craig Communications Ltd.

Price: £9.95
Game type: Simulation
Rating: 60%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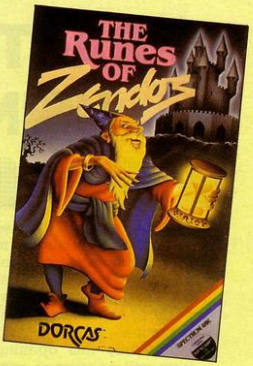
RUNES OF ZENDOS

WHEN Dorcas brought out their game **The Oracle's Cave,** it was very impressive. A fully animated adventure, with clear graphics, not tiny little characters! Very original, very good.

Their follow-up is less impressive, for the idea of the animated adventure has now been taken to greater lengths than Dorcas had imagined. **The Runes of Zendos** sees the player wandering around one of twelve different castle layouts, searching for a Runic Hour glass. Twelve separate adventures, although the problems which you encounter, and the characters you meet will be similar in each one.

In each location your options are limited. If you face unfriendly opponents without the weapon necessary to destroy them instantly you will have to fight them. The outcome relies on your strength and your weapons, but also on luck. Fights with a little luck involved are exciting, fights where too much of a random element is involved are frustrating and ultimately boring. Those in The Runes of Zendos fall into the latter of these two categories.

The graphics and animation are good, but not spectacular. The problems are monotonous: find the correct objects in the right order and use them in the right way. The fight scenes are tedious. Runes of Zendos suffers more than most games from the rivalry of other programs released at the same time. It is a moderately enjoyable adventure game, but is certainly not the best of its type on the Spectrum market this Christmas.



Produced for the 48K Spectrum by Dorcas Software.

Price: £7.95
Game type: Adventure
Rating 67%

THE MAGIC GARDEN

DOUGAL'S dreams have come true. Sugar has been scattered over the Magic Garden. So much sugar, in fact, that Dougal has decided to build himself a little sugar house.

He collects the sugar together before others in the garden can eat it, avoids touching the others, and then moves on to the next level. As the game becomes harder, the other characters begin to eat the sugar faster, and the only way to keep enough of it is to load it onto the train.

A non-violent game, this, for Dougal never dies, although he will be sent to bed if he bumps into other characters or does not eat enough sugar to keep him awake.

Problems with the games, are the graphics, which blur into each other as two characters meet, the erratic movement of all characters except Dougal, and the sound, which produces an excruciatingly slow rendition of the Magic Roundabout theme tune.

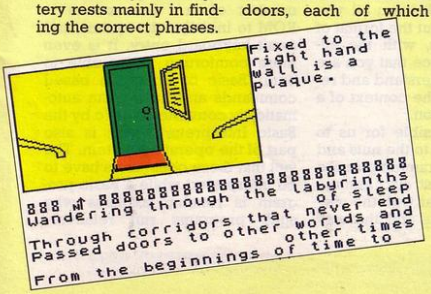
Produced for the 48K Spectrum by CRL, 9 Kings Yard, Carpenters Road, London E15.

Price: £5.95
Rating: 55%

SANDMAN COMETH

MYSTIC spiel, filled with references to the subconscious and the answer to life is always a good way to begin an adventure program. **The Sandman cometh,** with its intriguing title and cover sleeve sounds exciting and faintly mysterious. Unfortunately, the mystery rests mainly in finding the correct phrases.

You begin the adventure at the top of a flight of stairs. At the bottom of the stairs is a locked door. As you do not carry a key, this proves to be a tricky start to the game, until you notice the welcome mat on the ground in front of you. On the other side of the front door is a series of doors, each of which leads to a different scenario. The graphics are good, the locations are varied, but the vocabulary is painfully limited.



The VOCAB command lists all verbs available to you. Even this limited list speeds up the adventure only marginally, as the program seems oblivious to the concept of synonyms, and, for example, allows you to struggle with GO EAST, OPEN DOOR, IN, ENTER ROOM, PULL DOOR, PUSH DOOR, before finally conceding that the answer is THROUGH DOOR. Searching for the answer to a puzzle is one thing, having to fight to make even the simplest move is another. And why, oh why, did the programmer omit the word TAKE? See the key, type in TAKE KEY, and the computer proclaims its inability to do any such thing. Your mind turns to invisible force-fields or strange spells protecting the key, before it becomes apparent that the answer is to GET the key.

The graphics are clear and useful, the imagination used in the creation of many of the locations is obviously great. A pity, then, that the programmer elected to make this game so hostile to users.

The Sandman Cometh is produced for the Spectrum by Star Dreams, 17 Barn Close, Seaford, East Sussex.

Price: £10.95
Game type: Adventure
Rating: 60%

PRACTICAL PROGRAMMING USING MACHINE CODE

THIS is the first of a series of articles/tutorials on machine code programming, the object of which is to lead you as painlessly as possible into the whiz-kid world of super-fast graphics and animation.

Hopefully this opening statement will encourage any cynics who complacently feel that their command of Basic is good enough to do everything they may ever want to do on their Spectrums. Anyone who enjoys playing games as well as programming them cannot avoid being convinced of the rewards to be gained from m/c programming: speed of execution, high quality graphics, animation and sound effects which cannot be matched by Basic programs; these are fulfilling rewards in themselves. Combine m/c skills with the kind of imagination and inventiveness of which you may well have found yourself capable in high-level programming such as Basic, and you could find even more tangible rewards in your bank account!

A much more realistic reason for not wanting to get involved might be that you feel that you have not yet fully explored programming in Basic. Very sensible. I have previously said that it is always best to walk before you can run and, in any case, I must assume that you are a reasonably proficient high-level programmer who wants to break new ground. It is only when you reach this stage that the need to get deeper into your machine with m/c programming becomes irresistible.

Admittedly, there are a number of books around on this subject. In my opinion, though, none of them really inspire the newcomer with much confidence. Usually far too much weight is given to theory and not enough to practice. Those which do emphasize the practical side seem to throw you in the deep end or assume that all you want is a collection of m/c routines which you can build up as a dedicated toolkit.

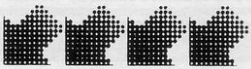
I have deliberately emphasized the word PRACTICAL in the title

of this opening article because the aim is that you should become increasingly confident in using m/c for practical applications. That means learning from worked examples, starting small in the next article (because we have some background to cover in this one first) and becoming progressively more advanced as the series unfolds. Each routine will be fully explained, together with the actual format of each new Z80 (the name given to the Spectrum Central Processing unit) instruction as it is met. Another drawback of reading books is the boring way most of them have of classifying and categorising the many Z80 mnemomics. You will still learn all you need to know about the format of these instructions, with the all-important difference that you are more likely to understand and remember them in the context of a practical application.

To make it possible for us to start getting down to the nuts and bolts of m/c programming in the next article, I must also assume that you are familiar with the way a computer counts and the way numbers are represented. For the latter aspect, I would strongly recommend you to re-read my October 1984 "Program Tutor" on numbers. For the rest, there are many good general purpose computing books on your library shelves. Binary and hexadecimal representation and arithmetic (including 2's complement arithmetic) may seem a bit alien at first but you should soon pick it up.

MAKING A START

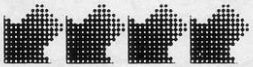
First then, we must understand what is meant by Machine Code. The term "low level" used earlier gives the best definition. The lower the level of the language being used to communicate with a computer, the more closely we approach the machine's native dialect. The Z80 microprocessor at the heart of your Spectrum (or Central Processing Unit) really only understands the 0s and 1s which tell it whether a bit is switched OFF or ON. Therefore only binary numbers can properly be called machine code.



Immediately you switch on your Spectrum the Z80 starts working through a pre-programmed set of such machine code instructions. This is the monitor progam which is part of the operating system designed by Sinclair Research. It is comfortable to assume that the machine is just sitting there waiting for you to do things to it when, in fact, it has already executed a number of m/c instructions in ROM to initialise the system and await keyboard entry. It is even more comforting to be able to enter Basic or Spectrum based commands and have them automatically converted to m/c by the Basic Interpreter which is also part of the operating system. The fact that these commands have to be interpreted while a Basic program is running explains why such programs run relatively

slowly.

Exactly how the Z80 interprets such binary numbers would mean getting into the electronic wizardry of the microprocessor itself. The m/c programmer need only understand that the Z80 is designed to interpret the binary representations of a set of codes which are instructions for it to do something, usually (but not always) with a number. To make such codes more intelligible to the programmer, mnemonics are



mnemonic which means "load register A with the number, n". This needs to be converted to pre-assigned binary codes to be intelligible to the Z80.

So how can this be m/c programming if such mnemonics have to be converted into m/c? Strictly speaking, the language used by the m/c programmer is not really m/c at all, but a higher level language called assembler. However, as a utility program which is quite independent of the operating system (unlike the Basic interpreter) is used to do the conversion, the name m/c programming is now universally accepted.

The utility program which does this conversion from assembler language (Z80 mnemonics or

source code) to m/c (object code) is also called an assembler. There are now a number of such programs commercially available for the Spectrum. There are also programs to reverse the process called disassemblers. These take m/c from memory and convert it to assembler code. So, whereas an assembler will convert your Z80 assembler code into m/c, a disassembler can provide the key to understanding m/c written by someone else. Such a program can be a very useful tool when probing the mysteries of the Spectrum ROM, especially if it is equipped with a monitor (not to be confused with the Spectrum monitor mentioned earlier). This will tell you what is happening to the various flags and registers as the code is being executed. More about these in a moment as they are at the very heart of the subject.

Having extolled the benefits of a good assembler and disassembler, do not feel that you must immediately run out and buy them. All the m/c routines I will be presenting will be accompanied by a Basic program to enter and run, so wait until you get a feel for what is happening. You will then be better able to judge what to buy.

ADDRESSES AND REGISTERS

Most numbers which your Spectrum has to handle need somewhere to live, besides being present in your program. This

is as true for m/c as it is for Basic. In Basic, we know they are sent off somewhere when we assign a variable name. In m/c, we have to start thinking of these homes for numbers as addresses, so that addressing is the process of taking a number out of its home (or giving it a home!)

It is the Z80 which has to move numbers about in this way. In common with the CPU of the largest mainframe computer, it simply does not have the capacity to communicate directly with every possible address in the outside world of either ROM or RAM so, instead, it gives a number a temporary home inside itself, called a register. A register, then, is a place in the CPU where a number can be operated on, usually (although not always) in between being taken from and passed back to memory.

The Z80 has a number of these registers. The most commonly used of these are labelled A (for Accumulator) and F (for Flags). The A register is favoured by the Z80 to hold the result of an eight bit arithmetic or logical operation. The F register is used to hold important information about the nature of the number held in the A register or the outcome of the execution of the last instruction.

These flags are very important as they are the key to the way the Z80 makes decisions as to which instruction to execute next. A flag

is the result of the CPU's own test of each of six bits in the eight bit F register, to indicate whether a condition is true or false (bit = 1 or 0). The flags themselves must first be set up (again, this is done automatically by the CPU). Which flags are affected depends on the type of operation last executed, so keep this in mind when reading the following list:

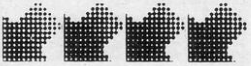
Zero Flag. This is straightforward enough, as the zero flag is

set if the result is zero.

Sign Flag. If you have done your homework on 2's complement arithmetic, you will know that the most significant bit of an eight bit byte indicates a negative number if a "1". So this flag depends on what is held in bit seven (the leftmost bit) of the register.

Carry Flag. The single byte registers mentioned can only deal with numbers in the range 0-255. The carry flag is set if the Z80 has to add to numbers in order to exceed this limit (called "binary overflow") or subtract a number from a smaller number ("binary underflow"). This flag is frequently used to make a decision on the comparison of 2 numbers.

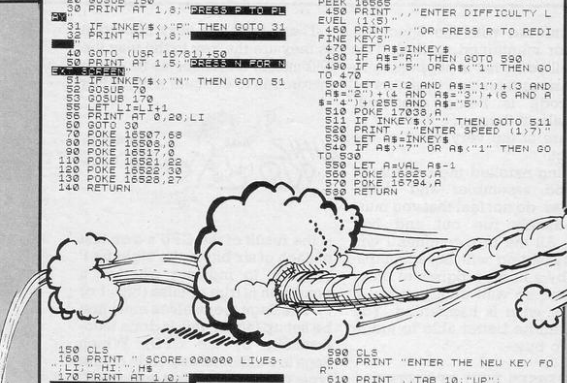
The other, less commonly



used, flags which I will explain when we meet them are **Negate, Overflow/Parity** and **Half Carry.**

Other registers for general purposes (also eight bit) are labelled B, C, D, E, H and L. These can be paired for 16 bit arithmetic (to handle numbers in the range 0-6553) and take the form AF, BC, DE and HL. There are other register pairs dedicated to certain functions.

```
 5 POKE 16418,0
 6 LET H$="000000"
 7 LET LI=5
 8 GOSUB 190
 10 GOSUB 70
 20 GOSUB 150
 30 PRINT AT 1,8;"PRESS P TO PL
AY"
 31 IF INKEY$<>"P" THEN GOTO 31
 32 PRINT AT 1,8;"
 40 GOTO (USR 15781)+50
 50 PRINT AT 1,5;"PRESS N FOR N
EW SCREEN"
 51 IF INKEY$<>"N" THEN GOTO 51
 52 GOSUB 70
 53 GOSUB 170
 55 LET LI=LI+1
 56 PRINT AT 0,20;LI
 60 GOTO 30
 70 POKE 16507,68
 80 POKE 16508,0
 90 POKE 16521,82
 110 POKE 16521,82
 120 POKE 16522,30
 130 POKE 16526,27
 140 RETURN
 150 CLS
 160 PRINT " SCORE:000000 LIVES:
";LI;" HI:";H$
 170 PRINT AT 1,0;
 180 PRINT
 190 PRINT
 200 PRINT
 210 RETURN
 260 LET S$=""
 260 LET D=(PEEK 16396+256*PEEK
16397)+8
 265 IF LI=1 THEN GOTO 310
 270 PRINT AT 1,5;"PRESS N FOR N
EW LIFE"
 271 IF INKEY$<>"N" THEN GOTO 27
1
 272 PRINT AT 1,5;"
 280 PRINT AT PEEK 16519,PEEK 16
 440 PRINT TAB 10;"DOWN=";CHR$ P
EEK 16573
 441 PRINT TAB 10;"LEFT=";CHR$ P
EEK 16561
 442 PRINT TAB 10;"RIGHT=";CHR$
PEEK 16565
 450 PRINT ,,,"ENTER DIFFICULTY L
EVEL (1-5)"
 460 PRINT ,,"OR PRESS R TO REDI
FINE KEYS"
 470 LET A$=INKEY$
 480 IF A$="R" THEN GOTO 590
 490 IF A$>"5" OR A$<"1" THEN GO
TO 470
 500 LET A=(2 AND A$="1")+(3 AND
 A$="2")+(4 AND A$="3")+(6 AND A
$="4")+(255 AND A$="5")
 510 POKE 17038,A
 511 IF INKEY$<>"" THEN GOTO 511
 520 PRINT ,,"ENTER SPEED (1)?)"
 530 LET A$=INKEY$
 540 IF A$>"7" OR A$<"1" THEN GO
TO 530
 550 LET A=VAL A$-1
 560 POKE 16525,A
 570 POKE 16794,A
 580 RETURN
 590 CLS
 600 PRINT "ENTER THE NEW KEY FO
R"
 610 PRINT ,,TAB 10;"UP";
 620 GOSUB 790
 630 POKE 16569,CODE A$
 635 PRINT TAB 10;"DOWN";
 636 GOSUB 790
 640 POKE 16573,CODE A$
 650 PRINT TAB 10;"LEFT";
 660 GOSUB 790
 670 POKE 16561,CODE A$
 680 PRINT TAB 10;"RIGHT";
 685 GOSUB 790
 690 POKE 16565,CODE A$
 700 GOTO 390
 790 IF INKEY$<>"" THEN GOTO 790
 800 LET A$=INKEY$
 810 IF A$="" THEN GOTO 800
 820 PRINT "=";A$
 830 RETURN
 840 SAVE "BYTEMAN"
 850 RUN
 860 LET A$="76767400C8000201020
1000000000003418ED4B7B402A8C400
EFE0DCA8641E5CDBB02444D51143E00
2803CB0077EFE3F282FFE282849FE2E2
863FE32E1C011"
 870 LET A$=A$+"2100197EFE830C8FE
1B2A941FE0DCA8641C600EFE5236001
36342A7B40192277B40C9E12B7EFE80C8
FE1BCC4941FE0DCA8641233600283634
2A7B402B227B40C9"
 880 LET A$=A$+"E1237EFE80C8FE1B
CC4941FE0DCA8641E3600023363428
4002B227B40C9E1112100C8ED527EFE
80C8FE1BCC4941FE0DCA8641193600C6
00ED5236342A7B40"
 890 LET A$=A$+"CD00ED52227B40C9
C5D5E5F5E5180A402B2283407CFE002820
1801A0C4001000007EFE2528073677
F1E1D1C1C9361C2B1477AFE0728FE1EE9
```



Written in a mixture of Basic and machine code is Byteman, a version of the arcade game Pac-man for the 16K ZX-81.

When entering the program first enter as line one REM followed by 130 full stops. Edit line one to make three new lines, so that lines one, two, three and four all consist of a REM statement followed by 130 full stops. Then enter the rest of the Basic program, checking very carefully the data contained in lines 860 onwards. Then type CLEAR. Save the program and type RUN 860.

After waiting for a few minutes, LIST the program. You should see 0 at the top left hand corner of the screen. Enter one REM followed by POKE 16419,1 and then LIST 1. This procedure should be repeated every time line zero is listed. Now type RUN to play.

Do your best to avoid the greedy byteman while you eat the pellets scattered around the maze. The easiest difficulty level is level one, and the fastest speed is speed one. Once you are certain that the game is functioning correctly, delete lines 860 onwards, save the program, then type RUN 840. The program will then save itself in its finished form and autorun.

BYTEMAN

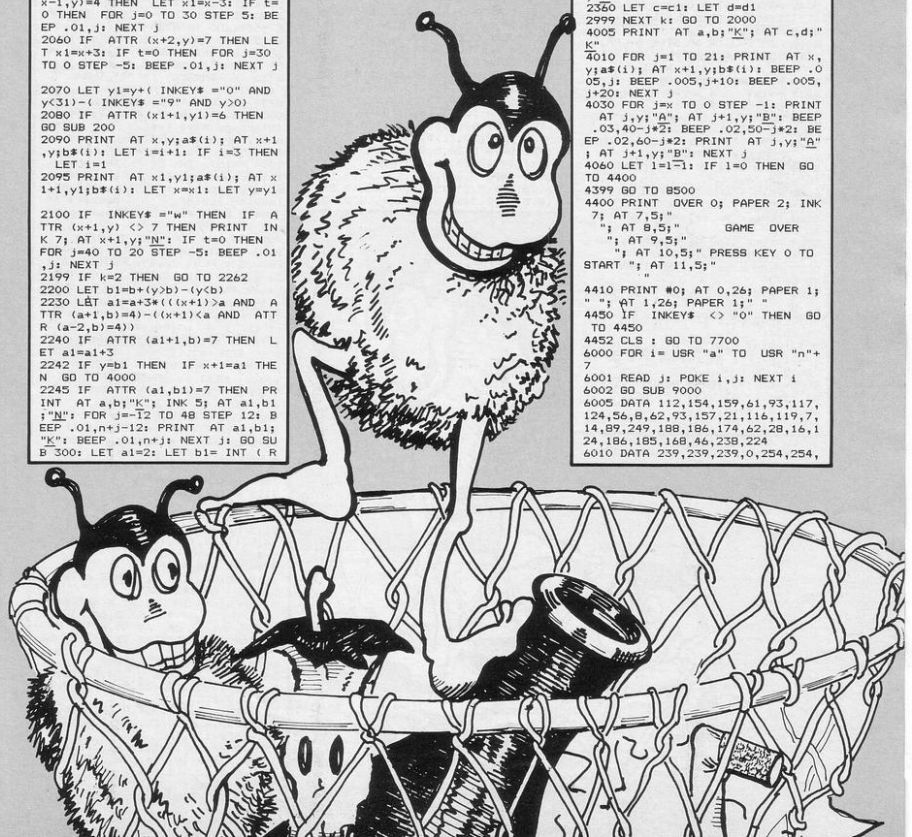
```
520;" ";AT PEEK 16521,PEEK 16522
);
 281 PRINT AT 2,1;"O"
 290 LET LI=LI-1
 300 GOTO 360
 310 FOR A=D TO D+6
 320 LET S$=S$+CHR$ PEEK A
 330 NEXT A
 340 IF VAL S$>VAL H$ THEN LET H
$=S$
 350 CLS
 351 PRINT AT 5,1;" YOU HAD A S
CORE OF ";VAL S$;,," WHEN YOU
WERE EATEN."
 352 PRINT ,,"      ANOTHER GAME
?"
 353 IF INKEY$="" THEN GOTO 353
 354 IF INKEY$="N" THEN STOP
 355 GOTO 20
 360 PRINT AT 0,20;LI
 370 GOSUB 70
 380 GOTO 40
 390 CLS
 391 PRINT TAB 7;"B Y T E M A N"
;TAB 7;"
 392 PRINT "  ▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄
▄▄▄▄▄▄▄▄▄▄▄▄▄▄
```

LITTERBUGS

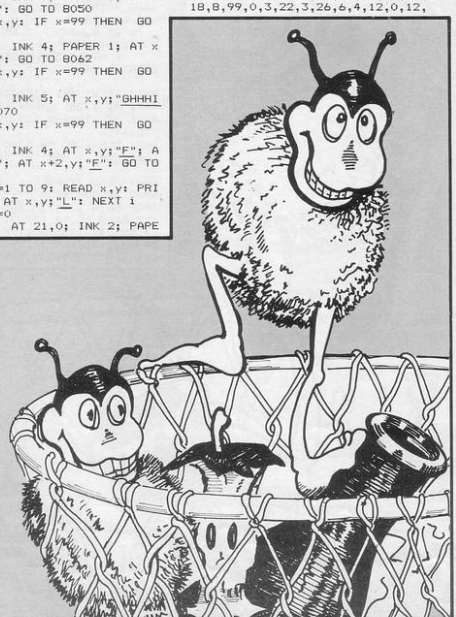
```
 10 RESTORE : PAPER 0: BORDER 0
: INK 7: OVER 0: CLS
 12 LET a$="CA": LET b$="DB": L
ET s=0: LET h=0
 15 GO TO 6000
 200 IF  ATTR (x1,y1) <> 6 THEN
 PRINT  INK 5; AT x1+1,y1;"L": G
O SUB 300: LET e=e+1: IF t=0 THE
N  FOR j=20 TO 40 STEP 5: BEEP .
01,j: NEXT j
 210 IF x1=1 AND y1=31 AND e=9 T
HEN  LET z=z+1: LET s=s+100: GO
TO 8000
 299 RETURN
 300 LET s=s+45: PRINT #0; OVER
0; AT 0,15- LEN  STR$ s; INK 6;
PAPER 1;s: RETURN
2000 FOR k=1 TO 2
2005 IF t=0 THEN  GO TO 2012
2010 READ n: IF n=7 THEN  RESTOR
E 9570: GO TO 2010
2011 BEEP .03,n+12
2030 IF  INKEY$ ="2" AND  ATTR (
x-1,y)=4 THEN  LET x1=x-3: IF t=
0 THEN  FOR j=0 TO 30 STEP 5: BE
EP .01,j: NEXT j
2060 IF  ATTR (x+2,y)=7 THEN  LE
T x1=x+3: IF t=0 THEN  FOR j=30
TO 0 STEP -5: BEEP .01,j: NEXT j

2070 LET y1=y+( INKEY$ ="O" AND
y<31)-( INKEY$ ="9" AND y>0)
2080 IF  ATTR (x1+1,y1)=6 THEN
GO SUB 200
2090 PRINT  AT x,y;a$(i); AT x+1
,y;b$(i): LET i=i+1: IF i=3 THEN
 LET i=1
2095 PRINT  AT x1,y1;a$(i); AT x
1+1,y1;b$(i): LET x=x1: LET y=y1

2100 IF  INKEY$ ="w" THEN  IF  A
TTR (x+1,y) <> 7 THEN  PRINT  IN
K 7; AT x+1,y;"N": IF t=0 THEN
FOR j=40 TO 20 STEP -5: BEEP .01
,j: NEXT j
2199 IF k=2 THEN  GO TO 2262
2200 LET b1=b+(y>b)-(y<b)
2230 LET a1=a+3*(((x+1)>a AND  A
TTR (a+1,b)=4)-((x+1)<a AND  ATT
R (a-2,b)=4))
2240 IF  ATTR (a1+1,b)=7 THEN  L
ET a1=a1+3
2242 IF y=b1 THEN  IF x+1=a1 THE
N  GO TO 4000
2245 IF  ATTR (a1,b1)=7 THEN  PR
INT  AT a,b;"K"; INK 5; AT a1,b1
;"N": FOR j=-12 TO 48 STEP 12: B
EEP .01,n+j-12: PRINT  AT a1,b1;
"K": BEEP .01,n+j: NEXT j: GO SU
B 300: LET a1=2: LET b1= INT ( R
ND *32): PRINT  AT a,b;"K"
2250 PRINT  AT a,b;"K"; AT a1,b1
;"K"
2260 LET a=a1: LET b=b1
2261 GO TO 2361
2300 LET d1=d+(y>d)-(y<d)
2330 LET c1=c+3*(((x+1)>c AND  A
TTR (c+1,d)=4)-((x+1)<c AND  ATT
R (c-2,d)=4))
2340 IF  ATTR (c1+1,d)=7 THEN  L
ET c1=c1+3
2342 IF y=d1 THEN  IF x+1=c1 THE
N  GO TO 4000
2345 IF  ATTR (c1,d1)=7 THEN  PR
INT  AT c,d;"K"; INK 5; AT c1,d1
;"N": FOR j=48 TO -12 STEP -12:
BEEP .01,n+j: PRINT  AT c1,d1;"K
": BEEP .01,n+j-12: NEXT j: GO S
UB 300: LET c1=3*(2+( INT ( RND
*6)))-1: LET d1=31: PRINT  AT c,
d;"K"
2350 PRINT  AT c,d;"K"; AT c1,d1
;"K"
2360 LET c=c1: LET d=d1
2999 NEXT k: GO TO 2000
4005 PRINT  AT a,b;"K"; AT c,d;"
K"
4010 FOR j=1 TO 21: PRINT  AT x,
y;a$(i); AT x+1,y;b$(i): BEEP .0
05,j: BEEP .005,j+10: BEEP .005,
j+20: NEXT j
4030 FOR j=x TO 0 STEP -1: PRINT
 AT j,y;"A"; AT j+1,y;"B": BEEP
.03,40-j*2: BEEP .02,50-j*2: BE
EP .02,60-j*2: PRINT  AT j,y;"A"
; AT j+1,y;"B": NEXT j
4060 LET l=1-l: IF l=0 THEN  GO
TO 4400
4399 GO TO 8500
4400 PRINT  OVER 0; PAPER 2; INK
 7; AT 7,5;"
  "; AT 8,5;"       GAME  OVER
   "; AT 9,5;"
    "; AT 10,5;" PRESS KEY 0 TO
START "; AT 11,5;"
                "
4410 PRINT #0; AT 0,26; PAPER 1;
" "; AT 1,26; PAPER 1;" "
4450 IF  INKEY$ <> "0" THEN  GO
TO 4450
4452 CLS : GO TO 7700
6000 FOR i= USR "a" TO  USR "n"+
7
6001 READ j: POKE i,j: NEXT i
6002 GO SUB 9000
6005 DATA 112,154,159,61,93,117,
124,56,8,62,93,157,21,116,119,7,
14,89,249,188,186,174,62,28,16,1
24,186,185,168,46,238,224
6010 DATA 239,239,239,0,254,254,
```

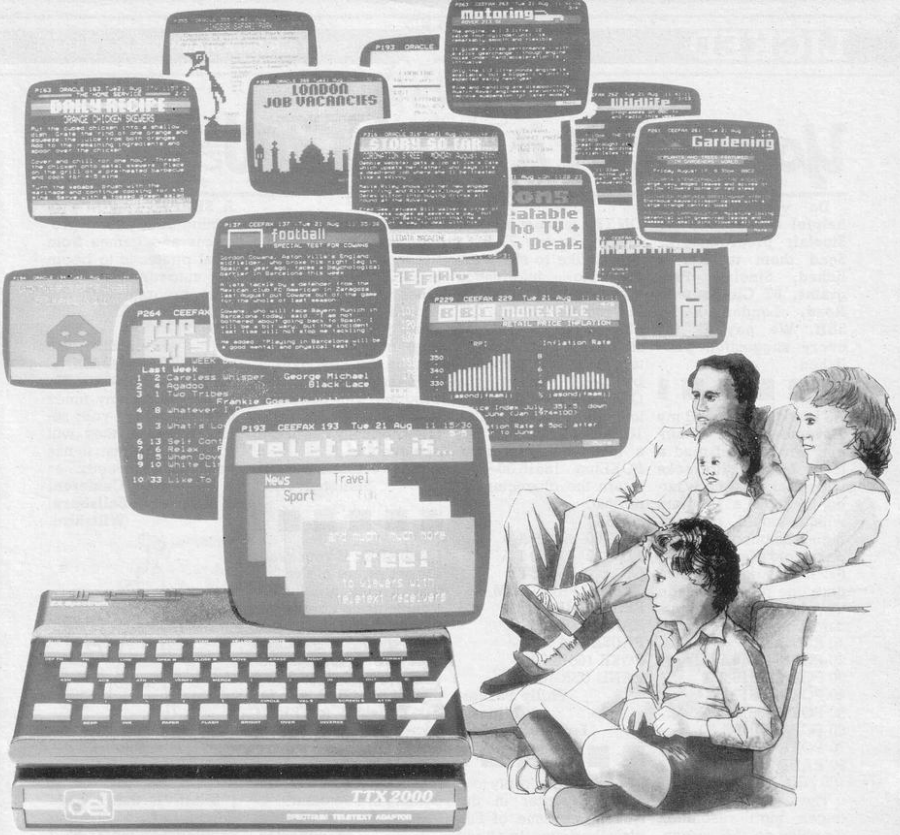
The Litterbugs have been at work, and it is your job to clear up after them. Two of the litterbugs are still present and will chase you as you pick up the rubbish. You can protect yourself by dropping litter baskets in their path. When you have picked up all the litter you can move on to the next screen.

Written for the 48K Spectrum by T. Sherwood of West Bromwich, West Midlands.



```
254,0,126,66,126,66,126,66,126,6
6,255,255,255,252,240,240,224,22
4
6015 DATA 255,231,255,0,0,0,0,0,
255,255,255,63,15,15,7,7,255,255
,183,221,107,170,84,0
6020 DATA 60,126,219,255,195,195
,126,60
6025 DATA 0,100,40,20,126,44,88,
0
6026 DATA 60,126,255,255,255,255
,255,159,0,0,195,36,66,36,66,60

7700 LET z=1: IF s>h THEN  LET h
=s
7710 LET l=3: LET s=0
7720 PRINT  INK 5; AT 11,0;"Pres
s key "; INK 6;"T"; INK 5;" for
continuous tune,"; AT 13,3;"or k
ey "; INK 6;"S"; INK 5;" for sou
nd effects."
7721 PRINT  AT 19,21;"C A A"; IN
K 5; AT 20,21;"D B B"
7724 IF  INKEY$ ="t" THEN  LET t
=1: GO TO 7730
7725 IF  INKEY$ ="s" THEN  LET t
=0: GO TO 7730
7729 GO TO 7724
7730 IF  INKEY$  <> "" THEN  GO
TO 7730
8003 FOR i=-24 TO 48 STEP 12: BE
EP .05,i: NEXT i
8005 IF z>5 THEN  LET z=1
8010 OVER 0: INK 7: PAPER 0: CLS

8011 PRINT  AT 0,0;"  LITTERBUGS
          SCREEN ";z
8012 PRINT  AT 0,0; INK 3; OVER
1;"(22*ig3)"; INK 5;"(8*ig3)"; I
NK 3;"(2*ig3)"
8013 FOR i=2 TO 20 STEP 3: PRINT
   INK 5; AT i,0;"
                    ": NEXT i
8015 RESTORE 8000+100*z
8017 PRINT  INK 6; AT 1,31;"M";
AT 2,31;"(ig8)"
8020 READ x,y: IF x=99 THEN  GO
TO 8050
8025 PRINT  INK 2; PAPER 6; AT x
,y;"EEEEEE": GO TO 8020
8050 READ x,y: IF x=99 THEN  GO
TO 8061
8060 PRINT  INK 3; PAPER 6; AT x
,y;"EEEEEE": GO TO 8050
8062 READ x,y: IF x=99 THEN  GO
TO 8065
8064 PRINT  INK 4; PAPER 1; AT x
,y;"JJJJJJ": GO TO 8062
8070 READ x,y: IF x=99 THEN  GO
TO 8072
8071 PRINT  INK 5; AT x,y;"GHHHI
": GO TO 8070
8072 READ x,y: IF x=99 THEN  GO
TO 8074
8073 PRINT  INK 4; AT x,y;"F"; A
T x+1,y;"F"; AT x+2,y;"F": GO TO
 8072
8075 FOR i=1 TO 9: READ x,y: PRI
NT  INK 6; AT x,y;"L": NEXT i
8080 LET e=0
8090 PRINT  AT 21,0; INK 2; PAPE
R 6;"EEEEEEEEEE"; INK 3;"EEEEEEE
EEE"; INK 2;"EEEEEEEEEEE"
8100 DATA 3,8,3,14,3,26,6,1,9,6,
9,12,9,20,15,2,15,6,15,12,99,0

8105 DATA 6,20,6,26,12,0,12,6,12
,9,12,20,12,26,15,23,15,26,18,0,
18,6,18,10,18,18,18,26,99,0
8110 DATA 3,20,3,22,6,7,15,9,99,
0
8115 DATA 9,15,18,9,18,21,99,0

8120 DATA 3,27,6,10,6,23,9,7,12,
12,12,24,15,4,15,29,18,8,18,20,9
9,0
8121 DATA 14,2,20,6,2,9,5,30,8,1
2,11,21,17,6,17,18,20,19
8200 DATA 3,2,3,14,12,16,12,22,1
5,7,15,26,99,0
8201 DATA 3,8,9,6,9,17,9,23,9,25
,12,5,12,7,15,23,99,0
8202 DATA 3,20,3,26,9,11,15,1,99
,0
8203 DATA 6,11,6,16,15,13,18,7,1
8,13,18,19,99,0
8204 DATA 3,6,6,6,6,21,9,27,12,1
5,15,12,15,18,18,6,18,12,18,18,1
8,24,99,0,5,12,8,18,8,29,11,10,1
4,2,14,30,20,22,2,4,17,8
8300 DATA 6,12,6,14,9,9,9,15,15,
12,15,14,18,5,18,23,18,26,99,0

8301 DATA 6,2,6,5,6,20,12,16,12,
21,15,19,15,26,99,0
8302 DATA 9,26,12,1,12,8,15,6,99
,0
8303 DATA 3,8,3,22,3,27,18,0,18,
11,99,0
8304 DATA 3,7,3,13,3,21,6,10,9,1
8,12,23,15,8,15,30,18,16,99,0
8305 DATA 5,5,14,30,2,11,8,30,11
,10,14,6,17,0,17,24,20,21
8400 DATA 3,26,9,0,9,13,12,4,12,
8,12,17,12,20,18,19,18,21,99,0,3
,9,3,15,6,1,6,4,9,10,9,19,15,26,
99,0,6,20,6,26,18,0,18,6,99,0
8401 DATA 12,26,15,8,15,13,15,18
,18,27,99,0,3,21,3,28,6,23,9,11,
9,21,12,9,15,7,15,23,18,25,99,0
8402 DATA 2,26,5,9,5,31,8,4,11,1
3,11,17,14,28,17,1,17,28
8500 DATA 3,6,3,8,6,1,6,18,6,19,
6,25,9,6,9,21,15,16,15,23,15,26,
18,8,99,0,3,22,3,26,6,4,12,0,12,
22,12,24,18,0,18,12,99,0
8501 DATA 3,0,3,14,9,26,12,16,99
,0,9,13,15,3,15,11,18,23,18,27,9
9,0,3,8,3,23,6,2,9,2,9,12,12,12,
15,20,18,20,18,27,99,0
8503 DATA 2,6,8,22,11,0,11,16,14
,4,14,27,17,0,17,14,17,31
8509 LET c=3*(2+( INT ( RND *6))
)-1: LET d=31: LET x=19: LET y=0
: LET x1=x: LET y1=y: LET a=2: L
ET b= INT ( RND *32)
8510 PRINT #0; PAPER 1; AT 0,0;"

"
8515 PRINT #0; INK 6; PAPER 1; A
T 0,4;"SCORE 00000"; INK 5; AT 1
,1;"HI SCORE 00000"; INK 4; AT 1
,20;"LIVES"
8516 PRINT #0; AT 0,15- LEN  STR
$ s; INK 6; PAPER 1;s; AT 1,15-
LEN  STR$ h; INK 5; PAPER 1;h
8590 OVER 1: INK 8: PAPER 8
8700 LET i=1: PRINT  AT x,y;a$(i
); AT x+1,y;b$(i); AT a,b;"K"; A
T c,d;"K"
8703 RESTORE 9540
8705 FOR k=1 TO 2: PRINT #0; AT
0,26;: FOR j=1 TO 1: PRINT #0; P
APER 1;a$(k);" "; NEXT j
8710 PRINT #0; AT 1,26;: FOR j=1
 TO 1: PRINT #0; INK 5; PAPER 1;
b$(k);" "; NEXT j
8720 READ n: IF n=0 THEN  RESTOR
E 9540: GO TO 8720
8725 BEEP .01,n; BEEP .01,n+12:
BEEP .01,n+12: BEEP .01,n+24: BE
EP .01,n+36: NEXT k
8730 IF  INKEY$ <> "0" THEN  GO
TO 8705
8799 RESTORE 9570: GO TO 2000
9003 PRINT  INK 4; AT 4,2;"The l
itterbugs have left       litte
r all around. Help me       to co
llect all the rubbish."
9004 PRINT  INK 5;" The angry
litterbugs usually     chase me b
ut I can protect       myself by
leaving litter         baskets in
 their path for        them to cr
ash into."
9005 GO SUB 9006: GO TO 9110
9006 PRINT  INK 6; AT 0,11;"LITT
ERBUGS": PLOT 42,19: RESTORE 911
3: FOR i=1 TO 12: READ x,y: DRAW
 x,y: NEXT i: PRINT  INK 6; AT 1
4,2;"Press key 0 to continue..."
; INK 5; AT 21,4;"D"; INK 6;"
L LL N  L";#0; AT 0,1; INK 2
; PAPER 6;"EEEEEEEEEEEEEEEEEEEE"
9007 FOR i=30 TO 60: IF  INKEY$
 <> "0" THEN  PRINT  AT 20,4;a$(
i/30): NEXT i: GO TO 9007
9035 IF  INKEY$ <> "" THEN  GO
TO 9035
9039 CLS : RETURN
9110 PRINT  INK 6; AT 4,2;"If I
pick up all the litter       then
I can pass through the       door
at the top which takes       me to
 the next screen."
9111 PRINT  INK 5;"          Th
ere are 5                    diffe
rent screens."
9113 DATA 14,22,-44,3,-12,8,6,88
,4,8,116,8,116,-4,8,-8,5,-88,-12
,-4,-176,-10,-25,-23
9114 GO SUB 9006
9118 PRINT  INK 2; PAPER 6; AT 4
,6;"    CONTROL KEYS    "
9120 PRINT  INK 4; AT 6,6;"LEFT
          9"; AT 8,6;"RIGHT
          0"; AT 10,6;"CLIMB
UP LADDER     2"; AT 12,6;"PUT DO
WN A BASKET   W"
9125 GO SUB 9006: RETURN
9540 DATA 2,2,4,4,5,5,4,4,2,2,5,
5,9,9,9,9,2,2,4,4,5,5,4,4,2,9,7,
4,2,2,2,2,0
9570 DATA 1,1,3,3,6,8,10,10,6,6,
8,8,10,8,6,6,10,10,8,8,3,3,3,3,8
,8,6,6,1,1,1,7
9581 DATA 2,1,2,1,2,1,2,3,2,3,2,
3,3,6,3,8,6,10,2,6,2,6,2,6,2,8,2
,8,2,8,3,10,3,8,6,6
9582 DATA 2,10,2,10,2,10,2,8,2,8
,2,8,3,3,3,3,6,3,2,8,2,8,2,8,2,6
,2,6,2,6,3,1,3,1,6,1,7,0
```





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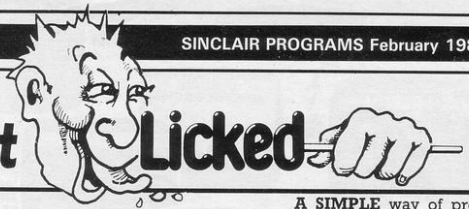
You've got it Licked



Do you have any helpful suggestions for Sinclair programmers? Send them to Got it licked, Sinclair Programs, 67 Clerkenwell Road, London EC1R 5BH. We pay £2 for every suggestion published.

AS I sat down to read my November issue of *Sinclair Programs*, I read a letter from A Horrocks which said that he wanted to know a program which would produce high-resolution graphics on our old friend, the ZX-81. I have found that a nine line program made up of POKE statements can achieve this.

```
10 REM.....
20 POKE 16514,62
30 POKE 16516,237
40 POKE 16517,71
50 POKE 16518,201
60 FOR N=0 TO 30
70 POKE 16515,N
90 RAND USR 16514
100 NEXT N
```

The program produces high resolution graphics on the screen, but you cannot control them.

Anthony Empson, aged 15, Plymouth, Devon.

ON THE subject of hi-res display on the ZX-81. I should like to share the following information with readers. The following routine sets the ZX-81's I register to 0. As the start of the Z80's dot pattern table is determined by the I register, any CHR$ PRINTed, followed by RAND USR 16514 will be turned into a meaningless pattern. POKEing 16515,30 will return the characters to normal.

```
  HEX
3E  00    LDA 0
ED  47    LD I A
C9        RET
  MAIN PROGRAM
PRINT CHR$ 255
RAND USR 16514
PAUSE 4E4
POKE 16515,30
RAND USR 16514
```

Philip Parker, Whitnash, Leamington Spa.

I AM writing in reply to A Horrocks letter in the November issue of *Sinclair Programs*. In all my magazines which contain high resolution graphics the main principles are:

```
28 FAST
29 FOR I=0 TO 112
30 POKE 31744+I,PEEK
(2161+I)
31 NEXT I
32 POKE 31800,63
33 POKE 31857,201
36 SLOW
```

Before you enter this program you must enter POKE 16389,124 NEWLINE followed by NEW NEWLINE. Then dimension an array: DIM A$(32,256). After you have done this do not use RUN or you will have to start again.

G Bayliss, Headington, Oxford.

A USEFUL memory-saving statement which I use in my ZX-81 program is PAUSE 4E4. This enables you to PAUSE the program in which it appears for as long as you like, until you press any key on the keyboard. It will then continue the program. This statement saves the two or three lines normally needed to achieve this.

William Turner, Staunton, Glos.

I WONDER if your readers are aware of the fact that, if they are having trouble using colour TVs as monitors, they can have their TV modified to make it compatible with the computer. I had my TV modified by a local TV shop for £15. I have now found a new life. Games are far more enjoyable, and programming easier when the colours are so clear.

R M Foss, Manchester.

A SIMPLE way of protecting your secret programs and games from local pirates is to begin an auto-running Spectrum program with the command RAND USR 2000.

This will produce the report TAPE LOADING ERROR on screen. No matter how many times they try to load your secret program, they will always think that it has not loaded correctly.

June Cameron, Salisbury, Wiltshire.

I BELIEVE that I have conquered loading problems on the ZX-81. I have written down my tips.

It is best to use a cassette recorder which has only a volume control and not a tone control.

Leave the volume control at maximum, and do not use the cassette recorder for any other purpose.

Check that the leads are secure.

I believe that this system will successfully LOAD and SAVE programs all the time.

Secondly, although your magazine is one of the better ones on the market, you should have more serious programs.

Julian Wadden, aged 13, Birchington, Kent.

EASY GRAPHICS

WORKING steadily through the Sinclair manual provides a sound introduction to Basic but it does mean that readers have to work through user-definable functions and simple trignometry before reaching the section concerning graphics. This is a pity, for it means encountering some of the more difficult elements of Basic before learning to use the more enjoyable parts.

Graphics on the Spectrum can be divided into two types. There are the graphic symbols which appear on keys one to seven and the user-defined graphics.

Initially, the graphic symbols appear to be the easiest to use. Change to graphics mode by pressing CAPS SHIFT and key nine, then press any of the keys one to seven, and a graphics character will appear on screen immediately. Simple but, unfortunately, not very useful.

Not even the most artistic programmer could hope to produce a good picture on the Spectrum by pressing the graphics keys in various combinations. The only way of producing a good picture is to sit down with some graph paper and design a picture, square by square.

A further problem is that not all combinations of squares can be obtained by simply entering graphics mode.

Take key five, for example; pressing this whilst in graphics mode will produce a square, the right hand side of which is black, and the left hand side of which is white. To produce a square which is the reverse of this, with black on the left and white on the right, it is necessary to hold down the CAPS SHIFT key while you press key five. The resulting character is known as an inverse graphic.

Working out a picture without squared paper can prove very difficult, even when you know it can be done. This is why *Sinclair Programs* sometimes employs graphics instructions when pictures are to be entered. These graphics instructions tell you which keys to press instead of telling you which characters will appear on screen. Each month these graphics instructions are explained on page five.

Combinations of graphics, inverse graphics and the normal character set can be very effective. It is, however, very difficult to move large pictures created in this way, whether you want to move them in one direction or animate them in any way. The best way of using such graphics is as the background for a game.

User-defined graphics allow you to work with the smallest characters on the screen, pixels. These are so small that graphics made up of them appear very clear and precise. The alphabet which the Spectrum prints on screen, for example, consists of twenty-six graphic characters.

To define a graphic it is, once again, necessary to find some graph paper. Characters consist of eight rows of eight pixels, so you will need a square made of 64 smaller squares.

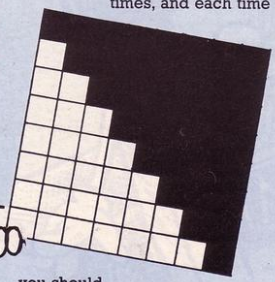
To work out the data you will need to store in the computer's memory, take the horizontal rows one at a time. Write down an eight digit number corresponding to each row, with a figure one corresponding to each filled in square, and a zero corresponding to each blank square. The character in figure one for example, would require the eight numbers 11111111, 01111111, 00111111, 00011111, 00001111, 00000111, 00000011 and 00000001.

These eight numbers can then be treated as binary numbers. They could be given to the computer as such but that would require a lot of space in the listing, and it is very easy to make a mistake when entering long strings of ones and zeros. Instead, convert them from binary to decimal. The eight numbers corresponding to figure one now become 255, 131, 63, 31, 15, 7, 3 and 1.

To use these numbers to form a graphics character, select the character you want to use; graphic A, for example. The following three lines will enter the information for you.

```
10 FOR n=0 TO 7
10 INPUT b: POKE USR "A"+n, b
30 NEXT n
```

The program will pause eight times, and each time you should type in one of your eight numbers. Changing to graphics mode and pressing A will now produce your user-defined graphic.



To prevent your having to type in figures every time you define a character, these figures are usually stored within data statements.

Programming — Slow and easy with Computer Sloth

MATCHSTICK PUZZLE

Matchstick puzzle is a version of the well known puzzle in which you have to force your opponent to take the last match. Your opponent in this case is the computer. The puzzle starts with thirty matches on the table. Remove either one, two or three matches in your bid to leave one remaining.

Written for the 16K Spectrum by Kwok Hung Tang, aged 12 of Coalville, Leicestershire.

This game uses special graphics characters and you should turn to Page 3 to find out how to enter them. Take care, particularly with the underlined letters a and b. These are not ordinary letters, as they must be entered by pressing a and b in graphics mode.

VARIABLES

A variable is a name given to a location in memory used by a program to store information. As the value of a variable changes, so the contents of this location are altered. A list of the important variables follows and will help you to understand how "MATCHSTICKS" works:

graphic "a" is the matchstick head

graphic "b" is the matchstick stalk

ms is the number of matchsticks

t is the number of matchsticks taken

HOW IT WORKS

Line Numbers	What they Do
10	Sets up screen colours.
30-50	Read data for User Defined Graphics. Data, for graphic "a" is in line 40 and "b" in line 50.
60-90	Ask whether instructions are wanted. The program then either prints instructions or starts to play.
100-126	Print instructions.
130-180	Set initial number of matchsticks (ms) to 30. The computer is then sent to the subroutine at Line 1000. At the start of the game this will show 30 matches (with ms=30 and t=0).
190	Gives either player or computer an equal chance of taking the first turn by testing a random number d (this may be 1 or 2).
200-350	This is the main loop in which the player and computer take turns at taking matches. Lines 200-220 control the player's turn with line 200 giving the "LOSE" message if the player ends up with the last match (when ms equals 1). Line 215 ensures that the number of matches taken can only be 1, 2 or 3. Line 220 calls the subroutine at Line 1000 to show matches remaining. Lines 295-350 are for the computer's turns. Line 300, 310 and 320 simply make sure that the computer takes the right number of matches to leave the player with the last. Line 330 means that the computer has been left with the last match and gives the player a "WIN" message. Line 335 is a "dummy" FOR/NEXT loop which simply slows the program down between turns, and creates an illusion of the computer having to think a bit. Line 340 is the big let down because here we discover that the computer has no strategy at all (except for the last few matches —

lines 300-320).

1000-1040 This is the subroutine for printing the number of remaining matches after the screen is cleared. This is done graphically, numerically and on a BEEP count. Yet another delay is put in at line 1035.

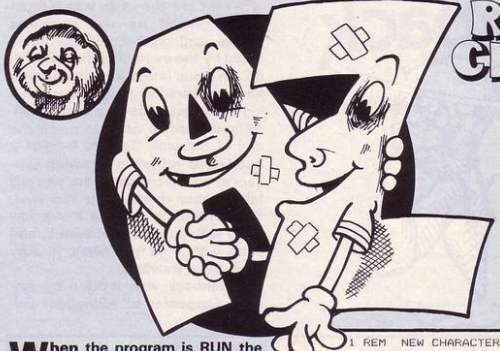
You might like to try improving the game by giving the computer a strategy to work with. You need to start with 29 matches (instead of 30) and replace line 340 where the computer starts second.

The idea is quite simple: A player may take 1, 2 or 3 matches at a time. All the computer has to do is to make this up to 4. Then, after 7 turns, 7×4=28 matches are gone so that it is left to the player (being first to start) to take the last.

```
 10 BORDER 7: PAPER 7: INK 0: C
LS
 30 RESTORE : FOR f= USR "a" TO
 USR "b"+7: READ a: POKE f,a: N
EXT f
 40 DATA 0,24,60,126,126,126,60
,24
 50 DATA 24,24,24,24,24,24,24,2
4
 60 PRINT  AT 21,0;"Do you want
 instructions (y/n)? "
 70 IF  INKEY$ ="n" OR  INKEY$
="N" THEN  BEEP .5,20: GO TO 130

 80 IF  INKEY$ ="y" OR  INKEY$
="Y" THEN  BEEP .5,10: GO TO 100

 90 GO TO 70
 100 BORDER 3: PAPER 7: INK 0: C
LS
 110 PRINT  FLASH 1; AT 0,7;"MAT
CHSTICK PUZZLE!"
 120 PRINT  AT 2,0;"  The object
 of the game is to  force the co
mputer to take the  last match.T
he most amount of  matchsicks y
ou can take at one  time is 3,th
e least is 1."
 125 PRINT #1;"      Press any ke
y to play": FOR m=0 TO 60: BEEP
.01,m: NEXT m: PAUSE 0
 126 FOR m=0 TO 10: BEEP .01,m:
NEXT m
 130 LET ms=30: LET t=0: BORDER
4: PAPER 5: CLS
 180 GO SUB 1000
 190 LET d= INT ( RND *2+1): IF
d=2 THEN  GO TO 295
 200 IF ms=1 THEN  CLS : PRINT
AT 10,8;"You lose (HA HA)"; AT 1
1,1;"Press any key for another g
ame": PAUSE 0: RUN
 205 PRINT  AT 19,11; FLASH 1;"Y
OUR TURN"
 210 INPUT "How many matches do
you want to take?";t
 215 IF t<1 OR t>3 THEN  GO TO 2
10
 216 FOR m=1 TO t: BEEP .3,m: NE
XT m
 220 GO SUB 1000
 295 PRINT  FLASH 1; AT 21,12;"M
y turn"
 300 IF ms=4 THEN  LET t=3: GO S
UB 1000: GO TO 200
 310 IF ms=3 THEN  LET t=2: GO S
UB 1000: GO TO 200
 320 IF ms=2 THEN  LET t=1: GO S
UB 1000: GO TO 200
 330 IF ms=1 THEN  CLS : PRINT
AT 10,8;"You win (Huh)"; AT 11,1
;"Press any key for another game
": PAUSE 0: RUN
 335 FOR w=0 TO 500: NEXT w
 340 LET t= INT ( RND *3+1): PRI
NT  AT 20,8;"I take ";t;" matche
s": FOR m=1 TO t: BEEP .3,m: NEX
T m: FOR h=0 TO 300: NEXT h: GO
SUB 1000
 350 GO TO 200
1000 LET ms=ms-t: CLS : FOR g=1
TO ms: PRINT  AT 5,g; INK 2;"A":
 BEEP .01,g
1020 PRINT  AT 6,g; INK 0;"B"; A
T 7,g; INK 0;"B"; AT 8,g; INK 0;
"B"
1030 NEXT g: PRINT  AT 0,7; INK
0;"MATCHSTICK PUZZLE!"; AT 1,0;"
Matchsticks=";ms
1035 FOR w=0 TO 200: NEXT w
1040 RETURN
```



REFORMED CHARACTERS

When the program is RUN the alphabet is displayed in the new style. Once this has finished press NEW and ENTER. Then POKE 23606,88: POKE 23607,251 and ENTER. A basic program can now be LOADed or typed in and any capital letters within the program will appear in the new design.

Reformed Characters was written for the 48K Spectrum by T. Sherwood of West Bromwich, West Midlands.

```
1 REM  NEW CHARACTER SET.
 2 REM  INSTRUCTIONS :-
LOAD this program from tape then
RUN.
When display says "FINISHED",
press NEW [ENTER]
Then  POKE 23606,88 :
      POKE 23607,251 [ENTER]
 3 REM Now type in or LOAD any
BASIC program. Any capital
letters will be to a different
design.
9400 CLEAR 64599
9405 PRINT  AT 5,9; FLASH 1;" PL
EASE WAIT "
9410 FOR i=15616 TO 16384
9411 LET j=i+48984
9415 POKE j, PEEK i: NEXT i
9420 POKE 23606,88: POKE 23607,2
51
9500 FOR i=64865 TO 65072: READ
j: POKE i,j: NEXT i
9501 DATA 60,126,102,126,126,102
,102,0,124,126,102,124,102,126,1
24,0,60,126,96,96,96,126,60,0,12
0,124,102,102,102,124,120,0,126

9502 DATA 126,96,124,96,126,126,
0,126,126,96,124,124,96,96,0,60,
126,96,110,98,126,60,0,102,102,1
02,126,126,102,102,0,126,126,24

9503 DATA 24,24,126,126,0,6,6,6,
6,102,126,60,0,100,108,104,112,1
20,108,102,0,96,96,96,96,96,126,
126,0,102,126,126,126,102,102
9504 DATA 102,0,102,118,118,126,
110,110,102,0,60,126,102,102,102
,126,60,0,124,126,102,124,120,96
,96,0,60,126,102,102,118,110
9505 DATA 60,0,124,126,102,124,1
08,102,102,0,60,126,96,126,6,126
,60,0
9506 DATA 126,126,24,24,24,24,24
,0,102,102,102,102,102,126,60,0,
102,102,102,102,102,60,24,0,102,
102,102,102,126,126,102,0,102
9507 DATA 102,60,24,60,102,102,0
,102,102,102,60,24,24,24,0,126,1
26,14,24,112,126,126,0
9600 PRINT  AT 5,9;"  FINISHED
"
9610 PRINT  AT 15,2;"ABCDEFGHIJK
LMNOPORSTUVWXYZ"
```

MARBLES

```
  1 LET SC=PI-PI
  2 LET E=SC
  3 LET F=E
100 CLS
110 FOR A=1 TO 9
120 PRINT AT A,1;"O"
130 NEXT A
140 IF SC>9 THEN GOTO 400
150 LET B=INT (RND*9)+1
160 PRINT AT B,22;"O"
170 PAUSE 100
180 IF INKEY$="" THEN GOTO 500
190 LET C=CODE INKEY$-28
200 FOR D=1 TO 20
210 PRINT AT C,D;" O"
220 NEXT D
230 IF C<>B THEN LET E=E+1
240 IF E=3 THEN GOTO 600
250 IF E>0 AND E<3 THEN GOTO 30
0
260 IF C=B THEN LET SC=SC+1
270 GOTO 100
300 CLS
310 PRINT "MISSED"
315 PAUSE 100
320 GOTO 100
400 CLS
410 PRINT "YOU WIN"
415 PAUSE 100
420 STOP
500 CLS
510 PRINT "TOO SLOW"
515 PAUSE 100
517 LET E=E+1
518 LET F=F+1
519 IF F=3 THEN GOTO 600
520 GOTO 100
600 CLS
610 PRINT "BANG"
615 PAUSE 100
620 STOP
```

IT SEEMED like a simple game of marbles. Nine marbles on the left, as soon as a box appeared on the right you pressed the number of the corresponding marble. Ten marbles into the boxes and you had won.

All appeared easy, until you discovered that missing a box primed a bomb, and that your third miss would cause it to explode. Can you win before you die?

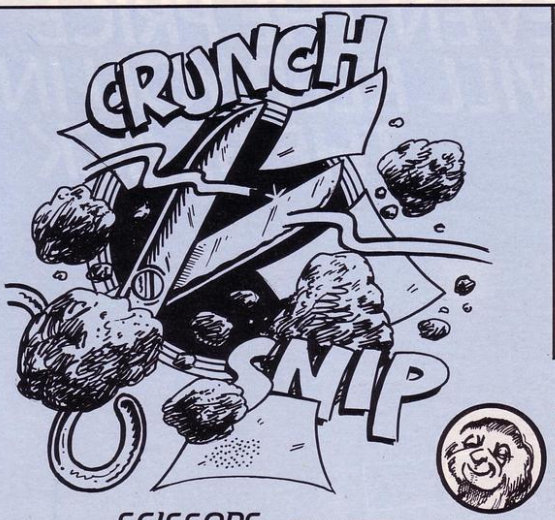
Written for the 1K ZX-81 by Katy Cameron, from Fife, Scotland.

Hunchback

Great are the trials which must be faced by the computer owner, and greater still are those faced by the owners of the 16K ZX-81. In your latest incarnation you have appeared as a Hunchback, living a peaceable life on a castle wall. All you want to do is to reach the end of the wall. Trouble is, that a murderous ruffian is throwing saucers at you. If one hits you, you will fall to your death from the wall. Your only chance is to move forward with 8, backward with 5, and jump with 0. If you want to stay alive, keep moving.

Hunchback was written by Andrew Carpenter of Abingdon, Oxfordshire.

```
  1 LET SC=0
  4 LET D=1
  5 LET E=0
  6 LET G=7
  7 LET B=29
 10 LET B=29
100 FOR A=8 TO 15
110 PRINT AT A,0;"▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀"
120 NEXT A
125 PRINT AT 0,9;"HUNCHBACK"
130 PRINT AT 1,5;"SCORE ";SC
135 PRINT AT 1,15;"LIVES ";L
200 FOR C=20 TO 5 STEP -5
210 PRINT AT C,31;"▌"
220 NEXT C
230 PRINT AT 5,30;"▀"
300 PRINT AT 7,6;"▄"
310 IF E=26 OR E=26 OR E=27 OR E=28 OR E=29 OR E=30 OR E=31 THE
N GOTO 5000
320 IF INKEY$="0" THEN GOTO 200
0
330 IF B=3 THEN GOTO 700
350 LET B=B-1
360 PRINT AT G,E;" "
370 LET E=E+(INKEY$="8" AND E<2
9)-(INKEY$="5" AND E>0)
500 IF E=B-1 OR B-1=E OR E+1=B
THEN GOTO 1000
600 GOTO 300
700 PRINT AT 7,5;" "
710 LET B=29
720 GOTO 500
1000 PRINT AT 20,10;"NO LIVES LE
FT"
1005 PRINT AT 21,0;"PRESS ANY KE
Y TO PLAY AGAIN"
1010 PAUSE 50
1020 IF INKEY$="" THEN GOTO 1020
1025 RUN
2000 PRINT AT G,E+1;" "
2005 LET G=G-1
2010 LET E=E+1
2040 PRINT AT G,E+1;"▀"
2050 PRINT AT G,E;" "
2060 LET E=E+1
2070 PRINT AT G,E;"▀"
2080 PRINT AT G,E;" "
2090 LET G=G-1
2095 LET E=E+1
2100 PRINT AT G,E;"▀"
2110 PRINT AT G,E;" "
2120 LET G=G+2
2130 LET E=E-2
2140 PRINT AT G,E;"▀"
2145 PRINT AT G,E;" "
2150 GOTO 550
5000 LET SC=SC+50
5010 GOTO 4
```



SCISSORS PAPER ROCK

```
  1 LET S=PI-PI
  2 LET C=S
  3 IF C>9 THEN GOTO 34
  4 IF S>9 THEN GOTO 31
  5 PAUSE 90
  6 CLS
  7 PRINT "S,P OR R"
  8 PRINT "YOU ";S
  9 PRINT "ME ";C
 10 INPUT A$
 11 CLS
 12 LET B=INT (RND*3)+1
 13 IF B=1 AND A$<>"S" THEN GOT
O 19
 14 IF B=2 AND A$<>"P" THEN GOT
O 23
 15 IF B=3 AND A$<>"R" THEN GOT
O 27
 16 CLS
 17 PRINT "SAME"
 18 GOTO 3
 19 PRINT "SCISSORS"
 20 IF A$="P" THEN LET C=C+1
 21 IF A$="R" THEN LET S=S+1
 22 GOTO 3
 23 PRINT "PAPER"
 24 IF A$="S" THEN LET S=S+1
 25 IF A$="R" THEN LET C=C+1
 26 GOTO 3
 27 PRINT "ROCK"
 28 IF A$="S" THEN LET C=C+1
 29 IF A$="P" THEN LET S=S+1
 30 GOTO 3
 31 CLS
 32 PRINT "YOU WIN"
 33 STOP
 34 PRINT "I WIN"
```


CHALLENGE your 1K ZX-81 to a game of Scissors, Paper, Rock. Select one of these three objects by pressing S, P or R. The computer will also make a choice. Scissors cut paper, paper wraps rock, and rock blunts scissors. The chooser of the victorious object gains one point. If you both choose the same object no points will be allocated. The winner is the first player with ten points.

To save memory, the value of PI has been used in the first line. Do not enter this letter by letter but select PI on the M key of your computer.

GUNSLINGER

YOUR '12' shooter gun moves down the right hand side of the screen at speed. A green bottle is placed in a random position at the left of the screen. To break the bottle, press "0" when you think the gun is opposite it. After 12 shots have been taken you will be told how many bottles you broke.

Gunslinga was written for the 16K Spectrum by Paul Williams of Tamworth, Staffs.

```
  5 LET s=0
 10 BORDER 1: PAPER 1: CLS
 20 FOR a=0 TO 7: READ b: POKE
 USR "b"+a,b: NEXT a: DATA 24,24
,24,60,60,60,60,60
 30 FOR a=0 TO 7: READ b: POKE
 USR "a"+a,b: NEXT a: DATA 16,48
,255,255,4,7,0,0
 40 FOR a=0 TO 7: READ b: POKE
 USR "c"+a,b: NEXT a: DATA 16,48
,240,224,224,224,224,64
 50 FOR g=1 TO 12
 55 LET b= INT ( RND *18)+2
 60 INK 4: PRINT  AT b,2;"B"
 70 LET c=0
 80 INK 5: PRINT  AT c,28;"AC"

 85 INK 1: PRINT  AT c-1,28;"
"; AT 21,28;"  "
 87 BEEP .01,0
 90 IF c>20 THEN  LET c=0
100 LET c=c+1
120 IF  INKEY$ ="0" THEN  GO TO
200
130 GO TO 80
200 BEEP .08,-25
210 FOR m=26 TO 2 STEP -1
220 INK 7: PRINT  AT c-1,m;".":
INK 1: PRINT  AT c-1,m+1;" "
230 IF c-1=b THEN  LET a$="HIT"
235 IF c-1=b THEN  LET s=s+1
240 IF c-1 <> b THEN  LET a$="M
ISS"
250 NEXT m
260 FLASH 1: INK 2: PAPER 6: PR
INT  AT c-1,0;a$: PAPER 1: FLASH
 0
265 BEEP .2,-30
270 FOR t=1 TO 125: NEXT t
290 CLS : NEXT g
300 PAPER 6: BORDER 6: INK 0: C
LS : PRINT "        Okay Gunslin
ger"
310 INK 2: PRINT : PRINT : PRIN
T : PRINT : PRINT "You managed t
o shoot ya self a  score of ";s
INK 1: FLASH 1: PRINT ;s/25;: FL
ASH 0: INK 2: PRINT " out of 12
of them": INK 4: PRINT "GREEN ";
: INK 2: PRINT "bottles."
320 PRINT : PRINT : INK 3: PRIN
T "Press ""0"" to go shooting ag
ain."
324 LET p=29
325 INK 0: PRINT  AT 19,p;"AC "
: PRINT  AT 19,0;"  ": LET p=p-1
: BEEP .005,0: FOR t=1 TO 8: NEX
T t: IF p<0 THEN  LET p=29
330 IF  INKEY$ ="0" THEN  BORDE
R 1: PAPER 1: LET s=0: CLS : GO
TO 50
340 GO TO 325
999 SAVE "Gun" LINE 5
```

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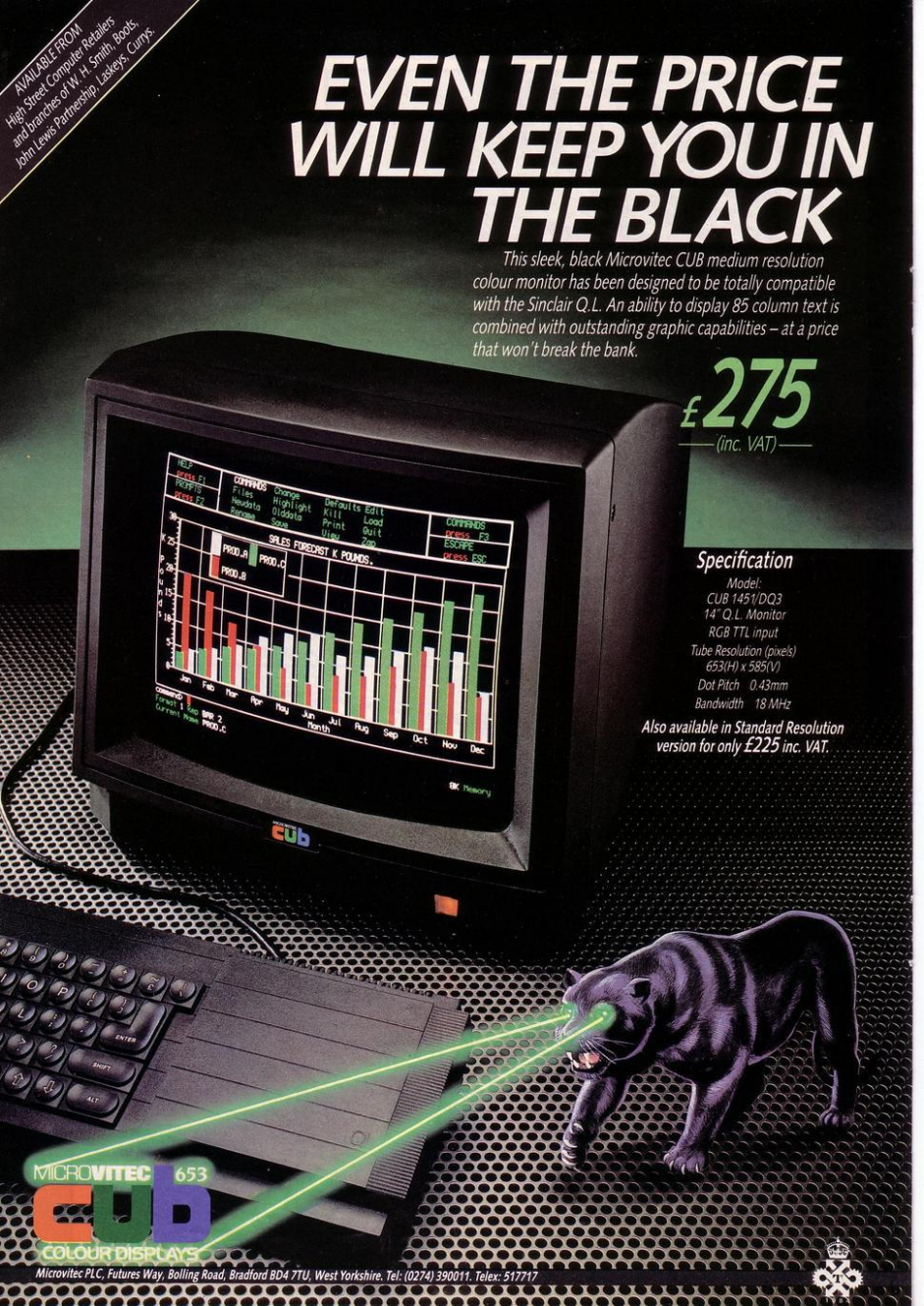

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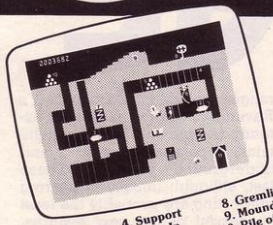

1. Nuggets
2. Giant Rats
3. Burrowing Rat
4. Support
5. Cave In
6. Snake
7. Snake Nest
8. Gremlin
9. Mound
10. Pile of Earth
11. Cave

FORTY NINER

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Riches await you – but so do the hazards!

ROCKET MAN

Get rich quick by collecting Diamonds that are simply lying there waiting for you!

Oh . . . I forgot to mention that there are one or two problems!

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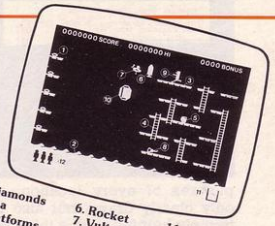
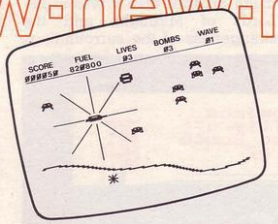
You have a Rocket Pack to help you (a Vulture on higher levels) but you must rush around the platforms and ladders collecting cans of fuel (legs of lamb with the Vulture) and cursing that weird Bubble. Once you have enough fuel then it's Chocks Away!

Oh . . . but don't run out of fuel on the way – otherwise it's . . . SPLASH!



1. Diamonds
2. Sea
3. Platforms
4. Ladders
5. Fuel Cans
6. Rocket
7. Vulture
8. Leg of Lamb
9. Player
10. Bubloid
11. Fuel Gauge
12. Men remaining

new·new·new·new·new·ne



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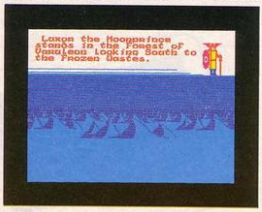
DOOMDARK'S REVENGE

LAST year, adventure enthusiasts reeled when they encountered the **Lords of Midnight.** A combination of adventure, quest and wargame, the game was remarkable in that it featured 4000 locations from which a total of 32 000 different views could be seen. Detailed



pictures of every location, not only clearly drawn but also extremely helpful; such a thing had not been seen on the Spectrum before.

Within a matter of months Beyond software had brought out the sequel, **Doomdark's Revenge.** Incredibly, they have managed to surpass their first success, producing a program with 48 000 screens, 123 different characters and 128 treasures to be found. Despite the fact that beyond Software, and the publishers of *Sinclair Programs* are sister companies it is easy to declare without fear of being accused of bias, that Doomdark's Revenge is the best new program on the market at the moment, and one of the best Spectrum programs ever produced.

The story starts where the Lords of Midnight finished. The land of Midnight is left far behind, and your characters move into the hostile land of the Icemark where, although there are many lords and many armies, none are your natural allies, and all must be won over by your skill and prowess.

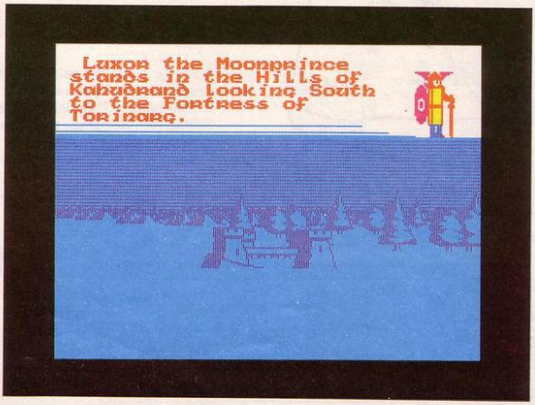
There is no one aim to the game which can be described in detail. The situation is that Morkin, hero of the Lords of Midnight, has been captured by the evil Shareth, Queen of the Icemark. His lover, Tarithel, has ridden into the Icemark to save him and behind her follow Luxor the Moonprince, Morkin's father; his trusted adviser Rorthron the Wise and Luxor's army. The most basic victory which can be won is the saving of Morkin. To win this victory, both Luxor and Morkin must return to the Gate of Varenorn, where Luxor began the game.

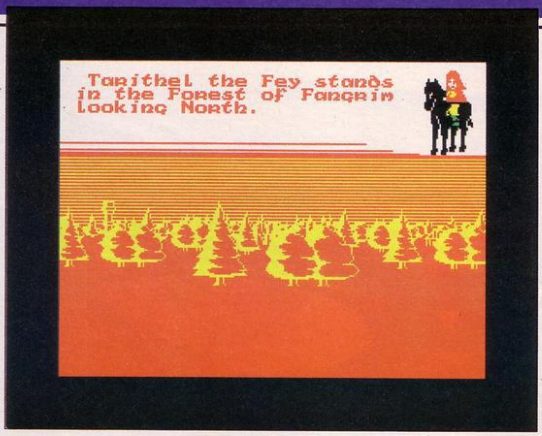
More major victories can be won by returning other major characters, spoils of war, or any of the arcane objects on which Shareth's power depends to the gate. If, by any chance, Morkin is killed, the only way in which the game can be won is to defeat Shareth in battle.

Those used to the views in the Lords of Midnight will be impressed by the even greater range provided in Doomdark's Revenge. Features have been extended to include huts and fountains, palaces, gates and underground passages. These last, although initially appearing interesting are probably the least successful of the new features. Underground passages wind for miles across the Icemark, the view within them is unchanging, and the flickering torches, although initially striking, become boring after a week or so spent underground.

Another feature of the game is the mist which spreads across the countryside, obscuring the view. Although features can be made out through the mist it is possible, for example, to stand one move away from a major fortress without being able to see it. Other changes in the landscape are the continually moving characters and armies, all of which appear clearly on screen.

The range of characters is much broader than it was in the Lords of Midnight, and the strangeness of the surroundings





means that none can be identified from the first as definitely good or definitely bad. Luxor enters the Icemark in the land of the Barbarians, which means that three or four Barbarian chiefs and their armies can be found within one or two day's ride. Luxor will find it relatively easy early in the game to recruit Barbarians, but this can only be done at a certain cost, for making alliances with one group means making enemies of their enemies. It may prove better to ride out of Barbarian country and recruit Ice Lords or dwarves, or giants.

As the game progresses, recruitment patterns change. In all cases, whenever you approach a commander you may not be able to win him to your side. Approaching commanders must therefore be done with care, for finding yourself in the camp of a strong hostile army after nightfall will often prove fatal.

Characters' feelings about you will change depending on whom you befriend, and which armies you fight. It is well to be aware of exactly where your allies' loyalties lie. Some characters, even though they have been recruited by you, will still remain loyal to another commander. Others will judge you by your prowess in battle, and will ignore you if your army is small, or if you have engaged in no battles.

Most worrying of all, once you have recruited a character there is no reason to believe that he will henceforth prove unswervingly loyal. If your side is doing badly, and another commander approaches with a better offer, you have every reason to suspect that your allies will leave in the night, or even turn on their friends and kill you during the night.

The options open to players

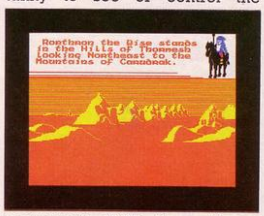
have, like every other aspect of adventure, been extended in Doomdark's Revenge. Decisions are still made by single key entry, but the range of choices is much wider than it was in the past. There is the possibility of changing persona from that of one loyal commander to the next. Once a persona has been adopted, that character's army can be reviewed, as can the armies of allies and of those occupying the same area. The area in which the character is standing can be checked, as can the outcome of any battle fought the previous night. It is also interesting to check your persona's own character. Unlike in the Lords of Midnight, where Luxor's allies tended to be utterly brave, noble and strong, in Doomdark's Revenge you often find yourself fighting alongside commanders who are cowardly, mean and greedy.

When each of your characters has completed their moves for the day the NIGHT key is pressed, and it is at this time that events controlled by the computer program take place. This results in the strange circumstance that all battles are fought by night, and that everyone, except the characters controlled by the player, moves around at night. It seems hardly surprising that troops seem almost invariably to be slightly tired.

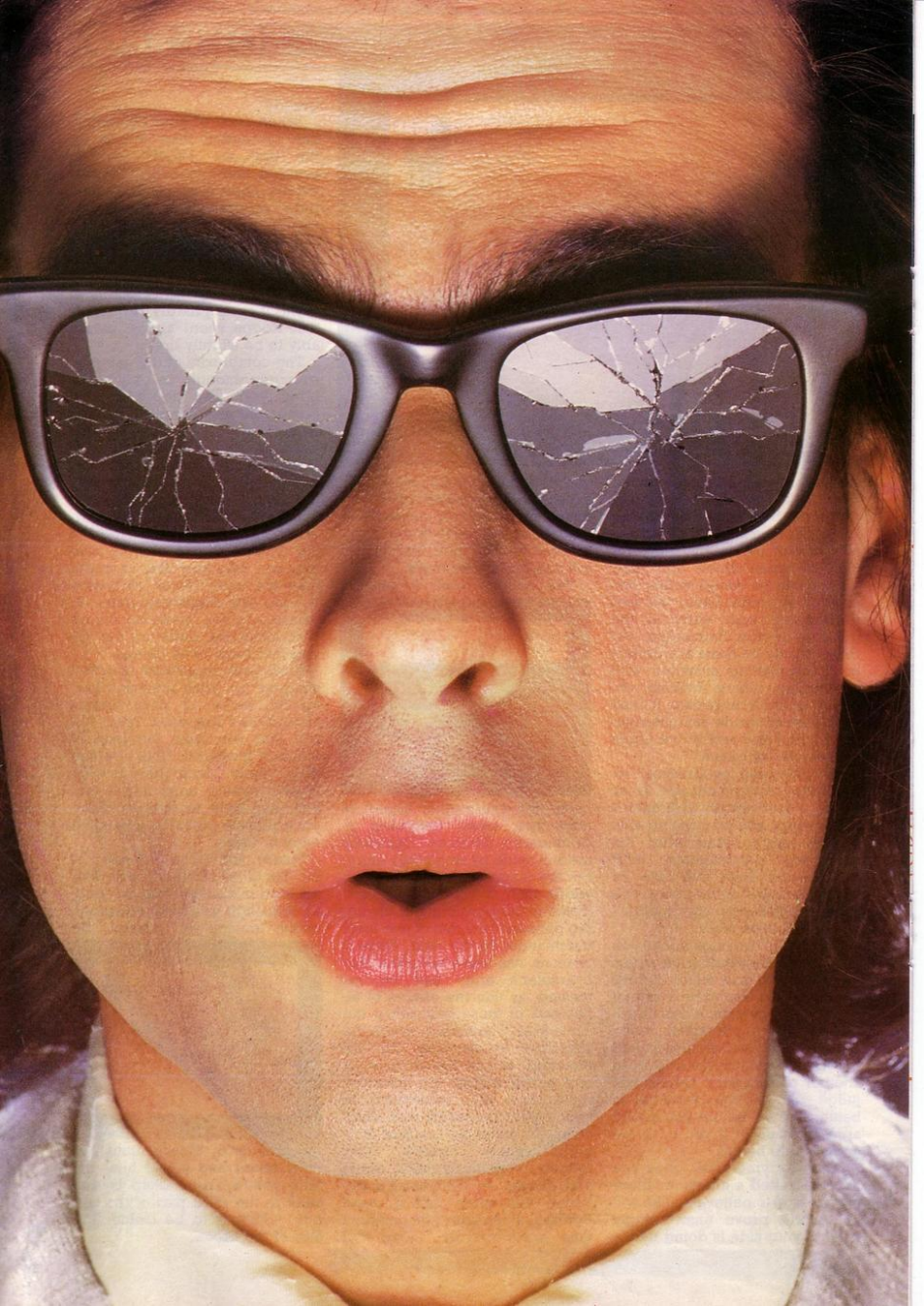
The complexity of the game is, strangely enough, its only stumbling point. The map which accompanies the game is pitifully inaccurate, giving you the impression of leading thousands of troops round in circles unless you keep very careful notes concerning your movements. Careful notes are, in fact, essential to every section of this game. Notes of the characters you control, who they are, who they like, to whom they are loyal. Notes on where you last saw characters, notes on where you are, notes on where your allies are, notes on the advice you have been given.

Keep your paperwork in order, sharpen up your memory and, ideally, invite all your friends around for a few days. Then you will feel you have the land of Icemark mastered. Until you can do all these things, the quest for Morkin should loom large, and you may have to relegate Shareth's ultimate defeat to some time early in 1986.

Finally, for those devotees of the Lords of Midnight who fear for Morkin's safety, fear no longer. Although you have no opportunity to see or control the



movements of Morkin until you have found and saved him, the little yellow-haired chap is due back in the third part of the trilogy, which is to be called **The Eye of the Moon.**



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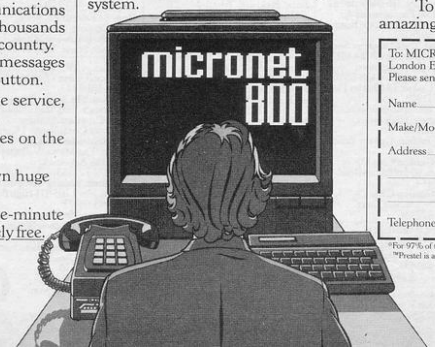

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Ellesmere Port. R F R TV & Audio, 1 Pooltown Road, Whitby. Tel: 051-356 4150.
Hyde. Tech Computers, 184 Market Street. Tel: 061-366 8223.
Macclesfield. Camera Computer Centre, 118 Mill Street. Tel: 0625 27468.
Macclesfield. Computer Centre, 68 Chestergate. Tel: 0625 618827.
Marple. Marple Computer Centre, 30-32 Market Street. Tel: 061-427 4328.
Stockport. National Micro Centres, 36 St Petersgate. Tel: 061-429 8080.
Stockport. Stockport Micro Centre, 4-6 Brown Street. Tel: 061-477 0248.
Widnes. Computer City, 78 Victoria Road. Tel: 051-420 3333.
Wilmslow. Wilmslow Micro Centre, 62 Grove Street. Tel: 0625 530890.

CLEVELAND

Middlesbrough. Boots, 88-90 Linthorpe Road, The Cleveland Centre. Tel: 0642 249616.

CUMBRIA

Kendal. The Kendal Computer Centre, Stramongate. Tel: 0539 22559.
Whitehaven. PD Hendren, 15 King Street. Tel: 0946 2063.
Workington. Technology Store, 12 Finkle Street. Tel: 0900 66972.

DERBYSHIRE

Alfreton. Gordon Harwood, 69-71 High Street. Tel: 0773 836781.
Chesterfield. Boots, 35-37 Low Pavement, Market Place. Tel: 0246 203591.
Chesterfield. Computer Stores, 14 Stephenson Place. Tel: 0246 208802.

DEVON

Exeter. Boots, 251 High Street. Tel: 0392 32244.
Exeter. Open Channel, Central Station, Queen Street. Tel: 0392 218187.
Plymouth. Syntax, 76 Cornwall Street. Tel: 0752 28705.
Seaton. Curtis Computer Services, Seaton Computer Shop, 51c Harbour Road. Tel: 0297 22347.
Tiverton. Actron Microcomputers, 37 Bampton Street. Tel: 0884 252854.

DORSET

Bournemouth. Brook Computers, 370 Charminster Road. Tel: 0202 533054.
Bournemouth. Lansdowne Computer Centre, 1 Lansdowne Crescent, Lansdowne. Tel: 0202 20165.
Dorchester. The Paper Shop, Kings Road. Tel: 0305 64564.

ESSEX

Chelmsford. Maxton Hayman, 5 Broomfield Rod. Tel: 0245 354495.
Colchester. Boots, 5-6 Lion Walk. Tel: 0206 577303.
Grays. H Reynolds, 28a Southend Road. Tel: 0375 31641.
Harlow. Laskys, 19 The Harvey Centre. Tel: 0279 443495.
Hornchurch. Comptel Computer Systems, 112a North Street. Tel: 0402 446791.
Ilford. Boots, 177-185 High Road. Tel: 01-553 2116.
Southend-on-Sea. Computerama, 88 London Road. Tel: 0702 335443.
Southend-on-Sea. Computer Centre, 336 London Road. Tel: 0702 337161.
Southend-on-Sea. Estuary Personal Computers, 318 Chartwell North, Victoria Circus Shopping Centre. Tel: 0702 614131.

GLOUCESTER

Cheltenham. Laskys, 206 High Street. Tel: 0242 570282.
Cheltenham. Screen Scene, 144 St Georges Road. Tel: 0242 52979.
Gloucester. Boots, 38-46 Eastgate Street. Tel: 0452 423501.

HAMPSHIRE

Basingstoke. Fishers, 2-3 Market Place. Tel: 0256 22079.
Southampton. Business Electronics, Micromagic At Atkins, 7 Civic Centre Road. Tel: 0703 25903.
Southampton. Tyrrell & Green, Above Bar. Tel: 0703 27711.

HERTFORD

Hitchin. County Computers, 13 Bucklesbury. Tel: 0462 36757.
Hitchin. G K Photographic & Computers, 68 Hermitage Road. Tel: 0462 52855.
Potters Bar. The Computer Shop, 197 High Street. Tel: 0707 44417.
Stevenage. DJ Computers, 11 Town Square. Tel: 0438 65501.
Watford. Laskys, 18 Charter Place. Tel: 0923 31905.
Watford. SRS Microsystems, 94 The Parade, High Street. Tel: 0923 26602.
Watford. Trewins, Queens Road. Tel: 0923 44266.
Welwyn Garden City. DJ Computers, 40 Fretherne Road. Tel: 96 28444.
Welwyn Garden City. Welwyn Department Store. Tel: 0707 323456.

HUMBERSIDE

Beverley. Computing World, 10 Swabys Yard, Dyer Lane. Tel: 0482 881831.

KENT

Beckenham. Supa Computers, 425 Croydon Road. Tel: 01-650 3569.
Bexleyheath. Laskys, 15-16 Broadway Shopping Centre. Tel: 01-301 3478.
Bromley. Boots, 148-154 High Street. Tel: 01-460 6688.
Bromley. Computers Today, 31 Market Square. Tel: 01-290 5652.
Bromley. Laskys, 22 Market Square. Tel: 01-464 7829.
Bromley. Walters Computers, Army & Navy, 64 High Street. Tel: 01-460 9991.
Chatham. Boots, 30-34 Wilmott Square, Pentagon Centre. Tel: 0634 405471.
Sevenoaks. Ernest Fielder Computers, Dorset Street. Tel: 0732 456800.
Sittingbourne. Computer Plus, 65 High Street. Tel: 0795 25677.
Tunbridge Wells. Modata Computer Centre, 28-30 St Johns Road. Tel: 0892 41555.

LANCASHIRE

Blackburn. Tempo Computers, 9 Railway Road. Tel: 0254 691333.
Blackpool. Blackpool Computer Store, 179 Church Street. Tel: 0253 20239.
Burnley. IMO Business Systems, 39-43 Standish Street. Tel: 0282 54299.
Preston. 4Mat Computing, 67 Friargate. Tel: 0772 561952.
Preston. Laskys, 1-4 Guildhall Arcade. Tel: 0772 24558.
Wigan. Wildings Computer Centre, 11 Mesnes Street. Tel: 0942 44382.

LEICESTERSHIRE

Leicester. Boots, 30-36 Gallowtree Gate. Tel: 0533 21641.
Market Harborough. Harborough Home Computers, 7 Church Street. Tel: 0858 63056.

LONDON

W1. Computers of Wigmore Street, 104 Wigmore Street. Tel: 01-486 0373.
W1. HMV, 363 Oxford Street. Tel: 01-629 1240.
W1. John Lewis, Oxford Street. Tel: 01-629 7711.
W1. Laskys, 42 Tottenham Court Road. Tel: 01-636 0845.
W1. Lion House, 227 Tottenham Court Road. Tel: 01-637 1601.
W1. Rother Cameras, 256 Tottenham Court Road Tel: 01-580 5826.
W1. The Video Shop, 18 Tottenham Court Road. Tel: 01-580 5380.
W1. Walters Computers, DH Evans, Oxford Street. Tel: 01-629 8800.
WC1. Transam Micro Systems, 59-61 Theobalds Road. Tel: 01-405 5240.
W5. Laskys, 18-19 Ealing Broadway Shopping Centre. Tel: 01-567 4717.
W8. Walters Computers, Barkers, Kensington High Street. Tel: 01-937 5432.
SW1. Peter Jones, Sloane Square. Tel: 01-730 3434.
SE9. Square Deal, 373-375 Footscray Road, New Eltham. Tel: 01-859 1516.
Lewisham. Laskys, 164 High Street. Tel: 01-852 1495.
SE13. Walters Computers, Army & Navy, 33 and 63 High Street, Lewisham. Tel: 01-852 4321.
SE15. Castlehurst Ltd, 152 Rye Lane, Peckham. Tel: 01-639 2205.
EC2. Devron Computer Centre, 155 Moorgate. Tel: 01-638 3339.
N7. Jones Brothers, Holloway Road. Tel: 01-607 2727.
N14. Logic Sales, 19 The Bourne, The Broadway, Southgate. Tel: 01-882 4942.
NW3. Maycraft Micros, 58 Rosslyn Hill, Hampstead. Tel: 01-431 1300.
NW4. Davinci Computer Store, 112 Brent Street, Hendon. Tel: 01-202 2272.
NW7. Computers Inc, 86 Golders Green. Tel: 01-209 0441.
NW10. Technomatic, 17 Burnley Road, Wembley. Tel: 01-208 1177.

MANCHESTER

Manchester. Boots, 32 Market Street. Tel: 061-832 6533.
Manchester. Laskys, 61 Arndale Centre. Tel: 061-833 9149.
Manchester. Laskys, 12-14 St Marys Gate. Tel: 061-833 0268.
Manchester. Mighty Micro, Sherwood Centre, 268 Wilmslow Road, Fallowfield. Tel: 061-224 8117.
Manchester. NSC Computer Shops, 29 Hanging Ditch. Tel: 061-832 2269.
Oldham. Home & Business Computers, 54 Yorkshire Street. Tel: 061-633 1608.
Swinton. Mr Micro, 69 Partington Lane. Tel: 061-728 2282.

MERSEYSIDE

Heswall. Thornguard Computer Systems, 46 Pensby Road. Tel: 051-342 7516.
Liverpool. George Henry Lee, Basnett Street. Tel: 051-709 7070.
Liverpool. Hargreaves, 31-37 Warbreck Moor, Walton. Tel: 051-525 1782.
Liverpool. Laskys, Dale Street. Tel: 051-236 3298.
Liverpool. Laskys, St Johns Precinct. Tel: 051-708 5871.
St Helens. Micro man Computers, Rainford Industrial Estate, Mill Lane, Rainford. Tel: 0744 885242.
Southport. Central Studios, 38 Eastbank Street. Tel: 0704 31881.

MIDDLESEX

Enfield. Laskys, 44-48 Palace Garden Shopping Centre. Tel: 01-363 6627.
Harrow. Camera Arts, 42 St Anns Road. Tel: 01-427 5469.
Hounslow. Boots, 193-199 High Street. Tel: 01-570 0156.
Teddington. Andrews, Broad Street. Tel: 01-977 4716.
Twickenham. Twickenham Computer Centre, 72 Heath Road. Tel: 01-892 7896.
Uxbridge. JKL Computers, 7 Windsor Street. Tel: 0895 51815.

NORFOLK

Norwich. Bonds, All Saints Green. Tel: 0603 24617.

NOTTINGHAMSHIRE

Sutton in Ashfield. H N & L Fisher, 57 Outram Street. Tel: 0623 54734.
Nottingham. Jessops, Victoria Centre. Tel: 0602 418282.
Nottingham. Laskys, 1-4 Smithy Row. Tel: 0602 413049.

OXFORDSHIRE

Abingdon. Ivor Fields Computers, 21 Stert Street. Tel: 0235 21207.
Banbury. Computer Plus, 2 Church Lane. Tel: 0295 55890.
Oxford. Science Studio, 7 Little Clarenden Street. Tel: 0865 54022.

SCOTLAND

Edinburgh. Boots, 101-103 Princes Street. Tel: 031-225 8331.
Edinburgh. John Lewis, St James Centre. Tel: 031-556 9121.
Edinburgh. Laskys, 4 St James Centre. Tel: 031-556 1864.
Glasgow. Boots, 200 Sauchiehall Street. Tel: 041-332 1925.
Glasgow. Boots, Union Street and Argyle Street. Tel: 041-248 7387.

SHROPSHIRE

Telford. Telford Electronics, 38 Mall 4. Tel: 0952 504911.

STAFFORDSHIRE

Newcastle-under-Lyme. Computer Cabin, 24 The Parade, Silverdale. Tel: 0782 636911.
Stafford. Computerama, 59 Foregate Street. Tel: 0785 41899.
Stoke-on-Trent. Computerama 11 Market Square Arcade, Hanley. Tel: 0782 268524.

SUFFOLK

Bury St Edmunds. Boots, 11-13 Cornhill. Tel: 0284 701516.
Ipswich. Brainwave Micros, 24 Crown Street. Tel: 047 350965.

SURREY

Croydon. Laskys 77-81 North End. Tel: 01-681 8443.
Croydon. The Vision Store, 96-98 North End. Tel: 01-681 7539.
South Croydon. Concise Computer Consultants, 1 Carlton Road. Tel: 01-681 6842.
Epsom. The Micro Workshop, 12 Station Approach. Tel: 0372 721533.
Guildford. Walters Computers, Army & Navy, 105-111 High Street. Tel: 0483 68171.
Haslemere. Haslemere Computers, 17 Lower Street. Tel: 0428 54428.
Wallington. Surrey Micro Systems, 53 Woodcote Road. Tel: 01-647 5636.
Woking. Harpers, 71-73 Commercial Way. Tel: 0486 225657.

SUSSEX

Bexhill-on-Sea. Computerware, 22 St Leonards Road. Tel: 0424 223340.
Brighton. Boots, 129 North Street. Tel: 0273 27088.
Brighton. Gamer, 71 East Street. Tel: 0273 728681.
Brighton. Laskys, 151-152 Western Road. Tel: 0273 725625.
Crawley. Gatwick Computers, 62 The Boulevard. Tel: 0293 37842.
Crawley. Laskys, 6-8 Queensway. Tel: 0293 544622.

TYNE & WEAR

Newcastle-upon-Tyne. Bainbridge, Eldon Square. Tel: 0632 325000.
Newcastle-upon-Tyne. Boots, Eldon Square. Tel: 0632 329844.
Newcastle-upon-Tyne. Laskys, 6 Northumberland Street. Tel: 0632 617224.
Newcastle-upon-Tyne. RE Computing, 12 Jesmond Road. Tel: 0632 815580.

WALES

Aberdare. Inkey Computer Services, 70 Mill Street, The Square, Trecynon. Tel: 0685 881828.
Aberystwyth. Aberdata at Galloways, 23 Pier Street. Tel: 0970 615322.
Cardiff. Boots, 26 Queens Street & 105 Frederick Street. Tel: 0222 31291.
Cardiff. P & P Computers, 41 The Hayes. Tel: 0222 26666.
Swansea. Boots, 17 St Marys Arcade, The Quadrant Shopping Centre. Tel: 0792 43461.

WARWICKSHIRE

Coventry. Coventry Micro Centre, 33 Far Gosford Street. Tel: 0203 58942.
Coventry. JBC Micro Services, 200 Earlsdon Avenue, North Earlsdon. Tel: 0203 73813.
Coventry. Laskys, Lower Precinct. Tel: 0203 27712.
Leamington Spa. IC Computers, 43 Russell Street. Tel: 0926 36244.
Leamington Spa. Leamington Hobby Centre, 121 Regent Street. Tel: 0926 29211.
Nuneaton. Micro City, 1a Queens Road. Tel: 0203 382049.
Rugby. OEM Computer Systems, 9-11 Regent Street. Tel: 0788 70522.

WEST MIDLANDS

Birmingham. Boots, City Centre House, 16-17 New Street. Tel: 021-643 7582.
Birmingham. Laskys, 19-21 Corporation Street. Tel: 021-236 6303.
Dudley. Central Computers, 35 Churchill Precinct. Tel: 0384 238169.
Stourbridge. Walters Computer Systems, 12 Hagley Road. Tel: 0384 370811.
Walsall. New Horizon, 1 Goodall Street. Tel: 0922 24821.
West Bromwich. D S Peakman, 7 Queens Square. Tel: 021-525 7910.
Wolverhampton. Laskys, 2 Wulfrun Square. Tel: 0902 714568.

YORKSHIRE

Bradford. Boots, 11 Darley Street. Tel: 0274 390891.
Leeds. Boots, 19 Albion Arcade, Bond Street Centre. Tel: 0532 33551.
Sheffield. Cole Brothers, Barkers Pool. Tel: 0742 78511.
Sheffield. Laskys, 58 Leopold Street. Tel: 0742 750971.
York. York Computer Centre, 7 Stonegate Arcade. Tel: 0904 641862.

THE CHART

1	Decathlon	Ocean
2	Underwurlde	Ultimate
3	Knight Lore	Ultimate
4	Pyjamarama	Mikrogen
5	Jet Set Willy	Software Projects
6	Avalon	Hewson
7	Full Throttle	Micromega
8	Booty	Firebird
9	Eureka	Domark
10	Tir Na Nog	Gargoyle

HEIGHTS ⬆ DEPTHS ⬇

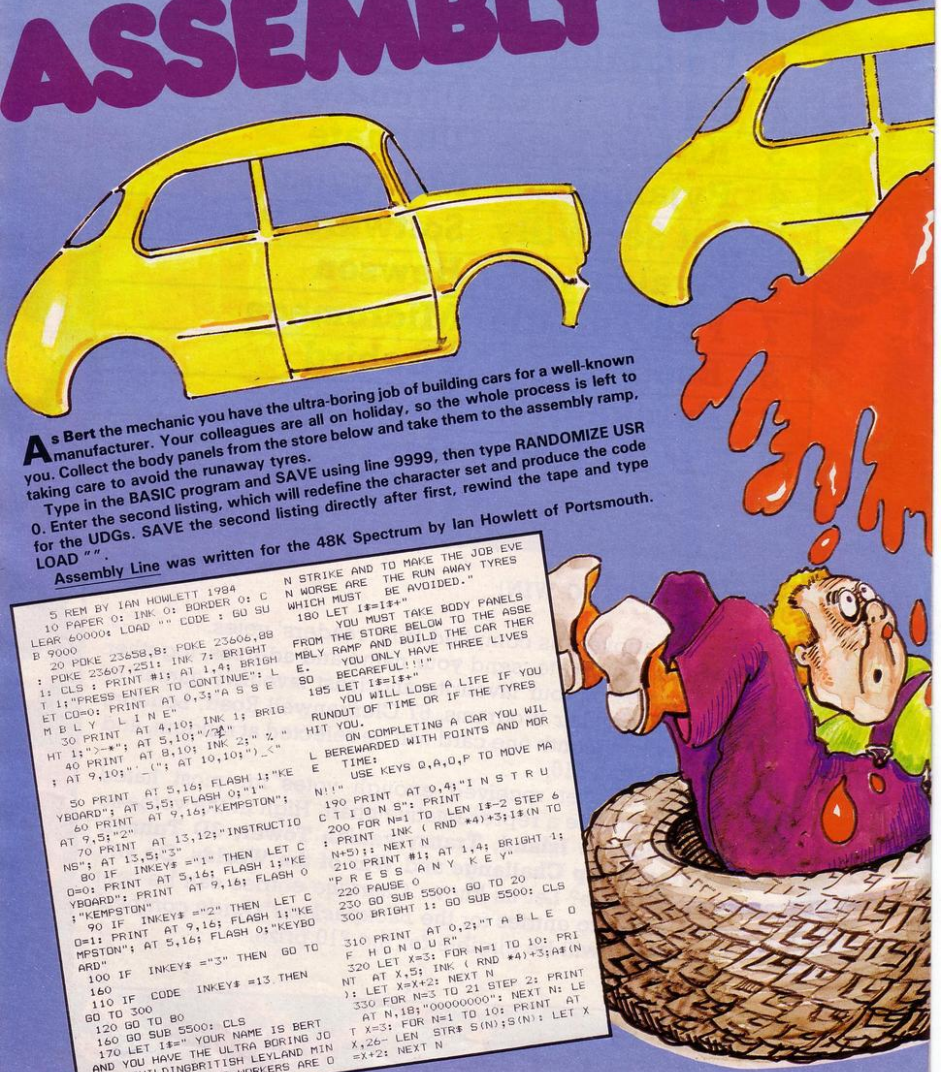
YOUR CHANCE TO WIN!

The chart above was compiled from readers' votes.

To register your vote, send your name and address, together with the names of your favourite and least favourite games to CHARTLINE, Sinclair Programs, 67 Clerkenwell Road, London, EC1R 5BH. Each month one card will be selected at random, and its writer will win £10.

We have not yet received enough votes for most hated program to compile a representative chart. High in the votes so far are **Espionage Island, Transylvanian Tower, 3D Tunnel, Light Cycle, Jump Challange** and **War of the Worlds.** Do you agree or disagree? Let us know. *Chartline* entries can be sent alone, or added to entries for the *Backpackers' Guide competition.* All entries will be eligible for the £10 prize.

ASSEMBLY LINE



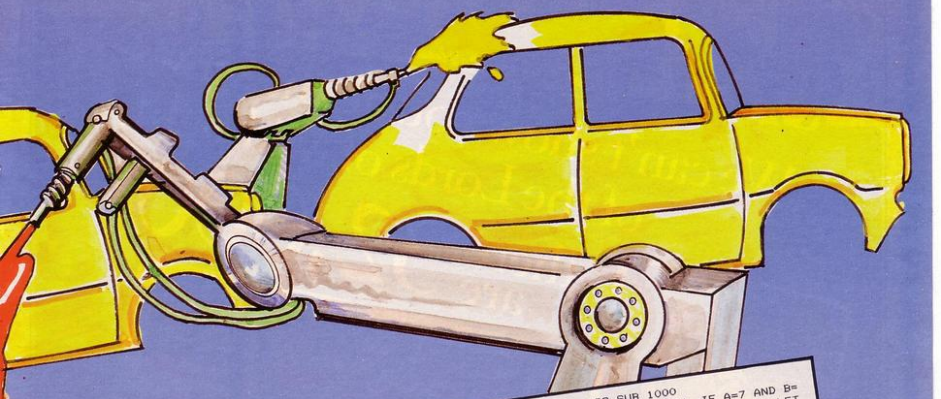
As Bert the mechanic you have the ultra-boring job of building cars for a well-known manufacturer. Your colleagues are all on holiday, so the whole process is left to you. Collect the body panels from the store below and take them to the assembly ramp, taking care to avoid the runaway tyres.

Type in the BASIC program and SAVE using line 9999, then type RANDOMIZE USR 0. Enter the second listing, which will redefine the character set and produce the code for the UDGs. SAVE the second listing directly after first, rewind the tape and type LOAD "".

Assembly Line was written for the 48K Spectrum by Ian Howlett of Portsmouth.

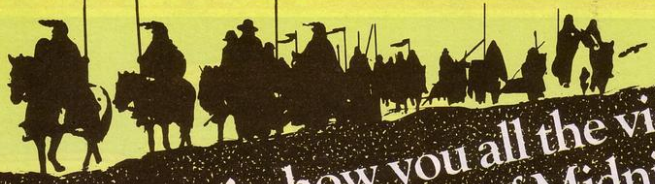
```
  5 REM BY IAN HOWLETT 1984
 10 PAPER 0: INK 0: BORDER 0: C
LEAR 60000: LOAD "" CODE : GO SU
B 9000
 20 POKE 23658,8: POKE 23606,88
: POKE 23607,251: INK 7: BRIGHT
1: CLS : PRINT #1; AT 1,4; BRIGH
T 1;"PRESS ENTER TO CONTINUE": L
ET CO=0: PRINT  AT 0,3;"A S S E
M B L Y   L I N E"
 30 PRINT  AT 4,10; INK 1; BRIG
HT 1;">-*"; AT 5,10;"/?"
 40 PRINT  AT 8,10; INK 2;" % "
; AT 9,10;"'_("; AT 10,10;")_<"

 50 PRINT  AT 5,16; FLASH 1;"KE
YBOARD"; AT 5,5; FLASH 0;"1"
 60 PRINT  AT 9,16;"KEMPSTON";
AT 9,5;"2"
 70 PRINT  AT 13,12;"INSTRUCTIO
NS"; AT 13,5;"3"
 80 IF  INKEY$ ="1" THEN  LET C
O=0: PRINT  AT 5,16; FLASH 1;"KE
YBOARD": PRINT  AT 9,16; FLASH 0
;"KEMPSTON"
 90 IF  INKEY$ ="2" THEN  LET C
O=1: PRINT  AT 9,16; FLASH 1;"KE
MPSTON"; AT 5,16; FLASH 0;"KEYBO
ARD"
100 IF  INKEY$ ="3" THEN  GO TO
160
110 IF  CODE  INKEY$ =13 THEN
GO TO 300
120 GO TO 80
160 GO SUB 5500: CLS
170 LET I$=" YOUR NAME IS BERT
AND YOU HAVE THE ULTRA BORING JO
B OF BUILDINGBRITISH LEYLAND MIN
IS. ALL THE  OTHER WORKERS ARE O
N STRIKE AND TO MAKE THE JOB EVE
N WORSE ARE  THE RUN AWAY TYRES
WHICH MUST   BE AVOIDED."
180 LET I$=I$+"
     YOU MUST TAKE BODY PANELS
FROM THE STORE BELOW TO THE ASSE
MBLY RAMP AND BUILD THE CAR THER
E.    YOU ONLY HAVE THREE LIVES
SO   BECAREFUL!!!"
185 LET I$=I$+"
     YOU WILL LOSE A LIFE IF YOU
RUNOUT OF TIME OR IF THE TYRES
HIT YOU.
     ON COMPLETING A CAR YOU WIL
L BEREWARDED WITH POINTS AND MOR
E   TIME:
     USE KEYS Q,A,O,P TO MOVE MA
N!!"
190 PRINT  AT 0,4;"I N S T R U
C T I O N S": PRINT
200 FOR N=1 TO  LEN I$-2 STEP 6
: PRINT  INK ( RND *4)+3;I$(N TO
N+5);: NEXT N
210 PRINT #1; AT 1,4; BRIGHT 1;
"P R E S S  A N Y  K E Y"
220 PAUSE 0
230 GO SUB 5500: GO TO 20
300 BRIGHT 1: GO SUB 5500: CLS

310 PRINT  AT 0,2;"T A B L E  O
F  H O N O U R"
320 LET X=3: FOR N=1 TO 10: PRI
NT  AT X,5; INK ( RND *4)+3;A$(N
): LET X=X+2: NEXT N
330 FOR N=3 TO 21 STEP 2: PRINT
  AT N,18;"00000000": NEXT N: LE
T X=3: FOR N=1 TO 10: PRINT  AT
X,26- LEN  STR$ S(N);S(N): LET X
=X+2: NEXT N
```

PRO-PRINTOUT



```
350 PRINT #1; AT 1,4; BRIGHT 1;
"PRESS ENTER TO CONTINUE"; IF C
ODE  INKEY$ <> 13 THEN  GO TO 3
50
360 GO SUB 5500: CLS
370 LET C=2: LET DR=1: LET C#="
J": LET D#="()": LET CR=0: LET
P1=1: LET P2=1: LET P3=1: LET P4
=1: LET P5=1: LET P6=1: LET TM=2
7: LET LVS=3: LET SC=0: LET CAR=
0: LET X$="AB": LET Y$="CD": LET
Z$="EF": LET A=17: LET B=8
380 DIM E(5): FOR N=1 TO 5: LET
E(N)=( RND *50)+10: NEXT N: LET
T$="";;;;;;;;;;;;;;;;;;;;;;;;;;
"
900 GO TO 2000
1000 BRIGHT 0: PRINT  AT A,B; OV
ER 1; INK 8; PAPER 8; BRIGHT 8;X
$; AT A+1,B; OVER 1; INK 8; PAPE
R 8; BRIGHT 8;Y$; AT A+2,B; OVER
 1; INK 8; PAPER 8; BRIGHT 8;Z$;
BRIGHT 1
1001 PRINT  AT 1,31;CR; AT 0,14-
LEN  STR$ SC;SC; AT 2,5; INK 5;
PAPER 2;T$( TO TM); PAPER 0; IN
K 7;" "; AT 1,14- LEN  STR$ CAR;
CAR; AT 0,21;" ©©©©©"( TO LV
S*2)
1002 REM  PRINT  AT 2,0;"TIME=";
INK 5; PAPER 2;T$( TO TM); PAPE
R 0;" "
1005 BRIGHT 0: PRINT  AT A,B; OV
ER 1; INK 8; PAPER 8; BRIGHT 8;X
$; AT A+1,B; OVER 1; INK 8; PAPE
R 8; BRIGHT 8;Y$; AT A+2,B; OVER
 1; INK 8; PAPER 8; BRIGHT 8;Z$;
BRIGHT 1
1009 IF CO=1 THEN  GO TO 1050
1010 IF  INKEY$ ="O" AND  ATTR (
A-1,B)=4 THEN  LET A=A-2
1020 IF  INKEY$ ="A" AND  ATTR (
A+3,B)=4 THEN  LET A=A+2
1030 IF  INKEY$ ="O" AND  ATTR (
A,B-1) <> 50 THEN  LET B=B-2: LE
T X$="GH": LET Y$="IJ": LET Z$="
KL"
1040 IF  INKEY$ ="P" AND  ATTR (
A,B+2) <> 50 THEN  LET B=B+2: LE
T X$="AB": LET Y$="CD": LET Z$="
EF"
1050 IF  ATTR (A+3,B) <> 4 AND
ATTR (A+3,B+1) <> 50 THEN  LET A
=A+2
1060 IF CO=0 THEN  GO TO 1600
1070 IF  IN 31=B AND  ATTR (A-1,
B)=4 THEN  LET A=A-2
1080 IF  IN 31=4 AND  ATTR (A+3,
B)=4 THEN  LET A=A+2
1090 IF  IN 31=1 AND  ATTR (A,B+
2) <> 50 THEN  LET B=B+2: LET X$
="AB": LET Y$="CD": LET Z$="EF"
1100 IF  IN 31=2 AND  ATTR (A,B-
1) <> 50 THEN  LET B=B-2: LET X$
="GH": LET Y$="IJ": LET Z$="KL"
1600 IF P6=0 THEN  IF P5=0 THEN
 IF P4=0 THEN  IF P3=0 THEN  IF
P2=0 THEN  IF P1=0 THEN  GO SUB
6000
1700 IF A>16 THEN  IF B=C OR B=C
+1 THEN  GO SUB 5600: LET CR=0:
LET TM=27: LET LVS=LVS-1: LET A=
17: LET B=8: GO TO 2000
1900 IF TM<0 THEN  LET LVS=LVS-1
: LET A=17: LET B=8: LET TM=27:
LET CR=0: GO SUB 5600: GO TO 200
0
1950 IF LVS=0 THEN  GO TO 7000
1999 LET TM=TM-.07: RETURN
2000 BRIGHT 0: CLS
2001 LET C=14: PRINT  AT 18,C; O
VER 1; INK 8; PAPER 8; BRIGHT 8;
C#; AT 19,C; OVER 1; INK 8; PAPE
R 8; BRIGHT 8;D#
2010 FOR N=4 TO 21: PRINT  AT N,
0; INK 2; PAPER 8;"ww"; AT N,30;
"ww"; NEXT N
2020 PRINT  AT 5,3;"IL"; AT 6,3;
"()"; AT 7,2;"IJL"; AT 8,2;"()(
)"; PRINT  AT 9,2; INK 2; PAPER
6;"wwwww"; AT 10,2;"wwwww"
2030 PRINT  AT 20,0; INK 2; PAPE
R 6;"wwwwwwwwwwwwwwwwwwwwwwwwww
wwwww"
2035 FOR N=17 TO 21: PRINT  AT N
,6; INK 4;"xy": NEXT N
2040 PRINT #1; AT 1,8; BRIGHT 1;
"ASSEMBLY PLATFORM"
2080 PRINT  AT 12,20; BRIGHT 1;"
z(5*ig8)@"
2085 PRINT  AT 19,20; BRIGHT 1;"
#(5*ig8)*"
2087 FOR N=13 TO 18: PRINT  AT N
,21; BRIGHT 1;"(4*ig8)+": NEXT N
2090 PRINT  AT 10,15; INK 2; PAP
ER 6;"wwwwwwwwwwwwwwww"; AT 11
,15; INK 2; PAPER 6;"wwwwwwwwww
wwwww"
2095 FOR N=7 TO 19: PRINT  AT N,
16; INK 4;"xy": NEXT N
2099 BRIGHT 1: GO SUB 9500
2101 GO SUB 1000
2500 IF CR=1 THEN  IF A=7 AND B=
20 THEN  LET P1=0: LET CR=0: LET
 SC=SC+50: GO SUB 4000
2510 IF CR=2 THEN  IF A=7 AND B=
22 THEN  LET CR=0: LET P2=0: LET
 SC=SC+50: GO SUB 4000
2520 IF CR=3 THEN  IF A=7 AND B=
24 THEN  LET CR=0: LET P3=0: LET
 SC=SC+50: GO SUB 4000
2530 IF CR=4 THEN  IF A=7 AND B=
26 THEN  LET CR=0: LET P4=0: LET
 SC=SC+50: GO SUB 4000
2540 IF CR=5 THEN  IF A=7 AND B=
24 THEN  LET CR=0: LET P5=0: LET
 SC=SC+50: GO SUB 4000
2550 IF CR=6 THEN  IF A=7 AND B=
20 THEN  LET CR=0: LET P6=0: LET
 SC=SC+50: GO SUB 4000
2600 BRIGHT 0: IF P1=0 THEN  PRI
NT  AT 6,20; INK 5;"ra"; AT 7,20
;"f(ig2)"
2610 IF P2=0 THEN  PRINT  AT 6,2
2; INK 5;"bc"; AT 7,22;"gh"
2620 IF P3=0 THEN  PRINT  AT 6,2
4; INK 5;"de"; AT 7,24;"(ig3)i"
2630 IF P4=0 THEN  PRINT  AT 7,2
6; INK 5;"jk"; AT 8,26;"pq"; AT
9,26;"v"
2640 IF P5=0 THEN  PRINT  AT 8,2
4; INK 5;"(ig8)o"; AT 9,25;"u"
2650 IF P6=0 THEN  PRINT  AT 8,2
0; INK 5;"lm"; AT 8,22;"n(ig8)";
 AT 9,21;"st"
2700 PRINT  AT 18,C; OVER 1; INK
 8; PAPER 8; BRIGHT 8;C#; AT 19,
C; OVER 1; INK 8; PAPER 8; BRIGH
T 8;D#
2710 LET C=C+1
2720 IF C=28 THEN  LET C=2
2730 PRINT  AT 18,C; OVER 1; INK
 8; PAPER 8; BRIGHT 8;C#; AT 19,
C; OVER 1; INK 8; PAPER 8; BRIGH
T 8;D#
2900 IF A>19 THEN  LET A=7: GO T
O 3000
2999 GO TO 2100
3000 BRIGHT 0: CLS
3001 LET C=8: PRINT  AT 18,C; OV
ER 1; INK 8; PAPER 8; BRIGHT 8;C
$; AT 19,C; OVER 1; INK 8; PAPER
 8; BRIGHT 8;D#
3002 PRINT #1; AT 1,11; BRIGHT 1
;"PARTS STORE"
3005 FOR N=10 TO 11: PRINT  AT N
,2; INK 2; PAPER 6;"wwwwwwwwww":
```

Continued on page 43



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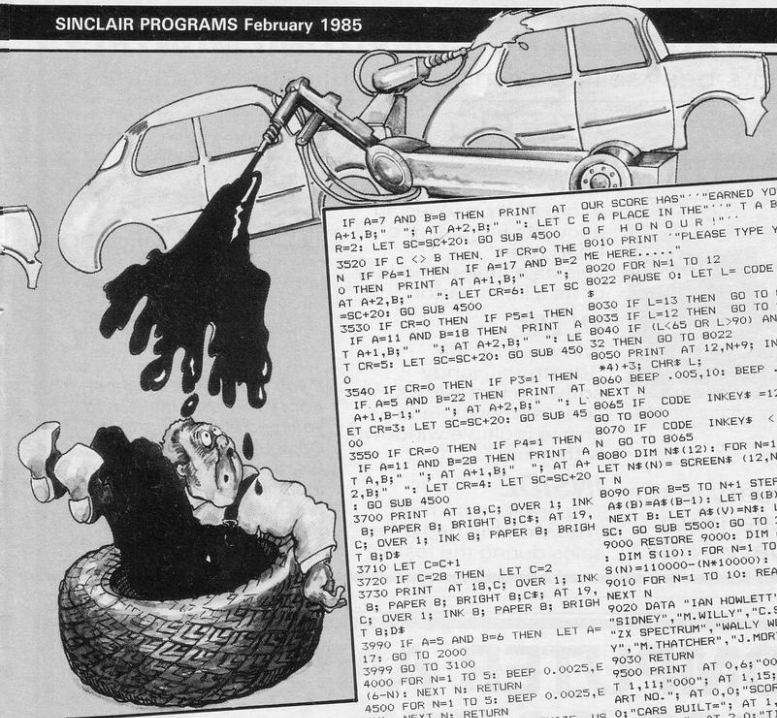

```
IF A=7 AND B=8 THEN  PRINT  AT
A+1,B;"  ": AT A+2,B;"  ": LET C
R=2: LET SC=SC+20: GO SUB 4500
3520 IF C <> B THEN  IF CR=0 THE
N  IF P&=1 THEN  IF A=17 AND B=2
0 THEN  PRINT  AT A+1,B;"  ";
AT A+2,B;"  ": LET CR=6: LET SC
=SC+20: GO SUB 4500
3530 IF CR=0 THEN  IF P5=1 THEN
IF A=11 AND B=18 THEN  PRINT  A
T A+1,B;"  "; AT A+2,B;"  ": LE
T CR=5: LET SC=SC+20: GO SUB 450
0
3540 IF CR=0 THEN  IF P3=1 THEN
IF A=5 AND B=22 THEN  PRINT  AT
A+1,B-1;"  "; AT A+2,B;"  ": L
ET CR=3: LET SC=SC+20: GO SUB 45
00
3550 IF CR=0 THEN  IF P4=1 THEN
IF A=11 AND B=28 THEN  PRINT  A
T A,B;"  "; AT A+1,B;"  "; AT A+
2,B;"  ": LET CR=4: LET SC=SC+20
: GO SUB 4500
3700 PRINT  AT 18,C; OVER 1; INK
8; PAPER 8; BRIGHT 8;C$; AT 19,
C; OVER 1; INK 8; PAPER 8; BRIGH
T 8;D$
3710 LET C=C+1
3720 IF C=28 THEN  LET C=2
3730 PRINT  AT 18,C; OVER 1; INK
8; PAPER 8; BRIGHT 8;C$; AT 19,
C; OVER 1; INK 8; PAPER 8; BRIGH
T 8;D$
3990 IF A=5 AND B=6 THEN  LET A=
17: GO TO 2000
3999 GO TO 3100
4000 FOR N=1 TO 5: BEEP 0.0025,E
(6-N): NEXT N: RETURN
4500 FOR N=1 TO 5: BEEP 0.0025,E
(N): NEXT N: RETURN
5500 FOR N=1 TO 8: RANDOMIZE US
R 64000: NEXT N: RETURN
5600 FOR N=7 TO 0 STEP -1: BORDE
R N: RANDOMIZE  USR 64100: NEXT
N: RANDOMIZE  USR 64220: IF LVS=
1 THEN  GO TO 7000
5610 RETURN
6000 BRIGHT 0: PAUSE 10: FOR N=1
TO 96: RANDOMIZE  USR 64100: BE
EP .02,N/2: NEXT N
6010 FOR N=6 TO 16
6015 DIM V$(17): FOR H=6 TO N+3:
PRINT  AT h,15;V$: NEXT H
6020 PRINT  AT N,20; INK 5;"rabc
de"; AT N+1,20;"f(ig$)gh(ig$)ijk
"; AT N+2,20;"lmn(2*ig@)opq"; AT
N+3,20;" st  uv"
6030 PRINT  AT N+4,15; INK 2; PA
PER 6;"wwwwwwwwwwwwwwww"; AT N+
5,15; INK 2; PAPER 6;"wwwwwwwww
wwwww"
6050 NEXT N
6060 PAUSE 100
6100 CLS : PRINT  AT 10,0;"ANDTH
ER CAR ROLLS OFF THE"; AT 12,14;
"PRODUCTION LINE!!!": PRINT #1;
AT 1,4;"SUPER BONUS = 500 POINTS
": FOR F=1 TO 50: BEEP .01,F-10:
BEEP .01,F-20: NEXT F: LET SC=S
C+500: LET P4=1: LET P5=1: LET P&=1
3=1: LET P1=1: LET P2=1: LET P
: IF LVS<5 THEN  LET LVS=LVS+1
6999 GO SUB 5500: LET TM=27: LET
CAR=CAR+1: GO TO 2000
7000 CLS : PRINT  AT 12,12;"GAME
OVER": FOR F=1 TO 400: NEXT F
7010 FOR V=1 TO 10: IF SC<S(V) T
HEN  NEXT V: GO SUB 5500: GO TO
20
7020 GO TO 8000
8000 GO SUB 5500: CLS : PRINT  A
T 0,0;"CONGRATULATIONS! Y
OUR SCORE HAS"''"EARNED YOUR NAM
E A PLACE IN THE"''" T A B L E
O F  H O N O U R !"''
8010 PRINT '"PLEASE TYPE YOUR NA
ME HERE....."
8020 FOR N=1 TO 12
8022 PAUSE 0: LET L= CODE  INKEY
$
8030 IF L=13 THEN  GO TO 8070
8035 IF L=12 THEN  GO TO 8000
8040 IF (L<65 OR L>90) AND L <>
32 THEN  GO TO 8022
8050 PRINT  AT 12,N+9; INK ( RND
*4)+3; CHR$ L;
8060 BEEP .005,10: BEEP .005,20:
NEXT N
8065 IF  CODE  INKEY$ =12 THEN
GO TO 8000
8070 IF  CODE  INKEY$ <> 13 THE
N  GO TO 8065
8080 DIM N$(12): FOR N=1 TO 12:
LET N$(N)= SCREEN$ (12,N+9): NEX
T N
8090 FOR B=5 TO N+1 STEP -1: LET
A$(B)=A$(B-1): LET 9(B)=S(B-1):
NEXT B: LET A$(V)=N$: LET S(V)=
SC: GO SUB 5500: GO TO 20
9000 RESTORE 9000: DIM A$(10,12)
: DIM S(10): FOR N=1 TO 10: LET
S(N)=110000-(N*10000): NEXT N
9010 FOR N=1 TO 10: READ A$(N):
NEXT N
9020 DATA "IAN HOWLETT","EDDIE",
"ZX SPECTRUM","WALLY WEEK","NOSE
Y","M.THATCHER","J.MORTIMER"
9030 RETURN
9500 PRINT  AT 0,6;"00000000"; A
T 1,11;"000"; AT 1,15;"HOLDING P
ART NO."; AT 0,0;"SCORE="; AT 1,
0;"CARS BUILT="; AT 1,14; AT 0,1
5;"LIVES="; AT 2,0;"TIME="
9510 RETURN
9999 CLEAR : LET X$="ASSEMBLY":
LET X$=X$+ CHR$ 202: SAVE X$ LIN
E 1: VERIFY "": GO SUB 9000:: GO
TO 20
```

```
NEXT N
3006 FOR N=9 TO 10: PRINT  AT N,
20;"  ": NEXT N
3010 FOR N=4 TO 21: PRINT  AT N,
0; INK 2; PAPER 6;"ww": AT N,30;
"ww": NEXT N
3020 FOR N=4 TO 19: PRINT  AT N,
6; INK 4;"xy": NEXT N
3030 FOR N=20 TO 21: PRINT  AT N
,0; INK 2; PAPER 6;"wwwwwwwwwwww
wwwwwwwwwwwwwwwwwwww": NEXT N
3040 PRINT  AT 14,14; INK 2; PAP
ER 6;"wwwww"; AT 14,24;"wwwww"
"; AT 15,14;"wwwww"; AT 15,24;"
wwwww": FOR N=11 TO 19: PRINT
AT N,16; INK 4;"xy"; AT N,26;"x
y"; AT N-6,26;"xy": NEXT N
3045 FOR N=8 TO 9: PRINT  AT N,2
1; INK 2; PAPER 6;"wwwww": NEXT
N
3050 IF P1=1 THEN  PRINT  AT 18,
2; INK 5;"ra"; AT 19,2;"f(ig3)"

3051 IF P2=1 THEN  PRINT  AT 8,8
; INK 5;"bc"; AT 9,8;"gh"
3052 IF P3=1 THEN  PRINT  AT 6,2
2; INK 5;"de"; AT 7,22;"(ig3)i"

3053 IF P4=1 THEN  PRINT  AT 11,
28; INK 5;"jk"; AT 12,28;"pq"; A
T 13,28;"v"
3054 IF P5=1 THEN  PRINT  AT 12,
18; INK 5;"(ig@)o"; AT 13,19;"u"

3055 IF P6=1 THEN  PRINT  AT 18,
20; INK 5;"1mn(ig@)"; AT 19,21;"
st"
3099 BRIGHT 1: GO SUB 9500
3100 GO SUB 1000
3500 IF CR=0 THEN  IF P1=1 THEN
IF A=17 AND B=2 THEN  PRINT  AT
A+1,B;"  "; AT A+2,B;"  ": LET
CR=1: LET SC=SC+20: GO SUB 4500
3510 IF CR=0 THEN  IF P2=1 THEN
```

2nd Listing

```
 5 CLEAR 64000: PRINT "THIS PR
OGRAM WILL POKE IN ALL  THE MAC
HINE CODE USED IN THE  GAME...
...."
 10 PRINT "POKING IN CLS DATA"
 20 RESTORE 20: LET T=0: FOR N=
64000 TO 64016: READ A: POKE N,A
: LET T=T+A: NEXT N: IF T <> 149
0 THEN  GO TO 9000: DATA 33,0,64
,1,0,24,203,6,203,134,35,11,120,
177,32,246,201
 30 PRINT "POKING IN COLOUR DAT
A"
 40 RESTORE 40: LET T=0: FOR N=
64100 TO 64125: READ A: POKE N,A
: LET T=T+A: NEXT N: IF T <> 242
1 THEN  GO TO 9000: DATA 33,0,88
,1,3,0,126,198,1,230,7,95,126,19
8,8,230,56,131,119,35,16,240,13,
32,237,201
 50 PRINT "POKING IN SOUND DATA
"
 60 RESTORE 60: LET T=0: FOR N=
64200 TO 64229: READ A: POKE N,A
: LET T=T+A: NEXT N: IF T <> 314
2 THEN  GO TO 9000: DATA 243,17,
16,208,38,10,58,72,92,31,31,31,1
4,254,238,16,237,121,67,16,254,3
```

Continued on page 45

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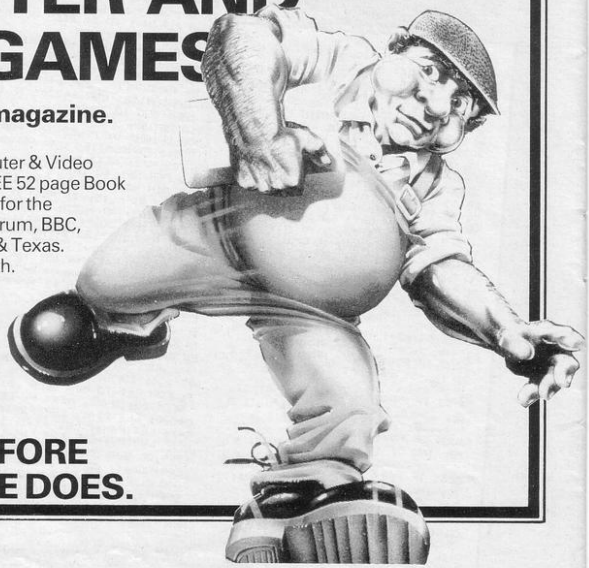

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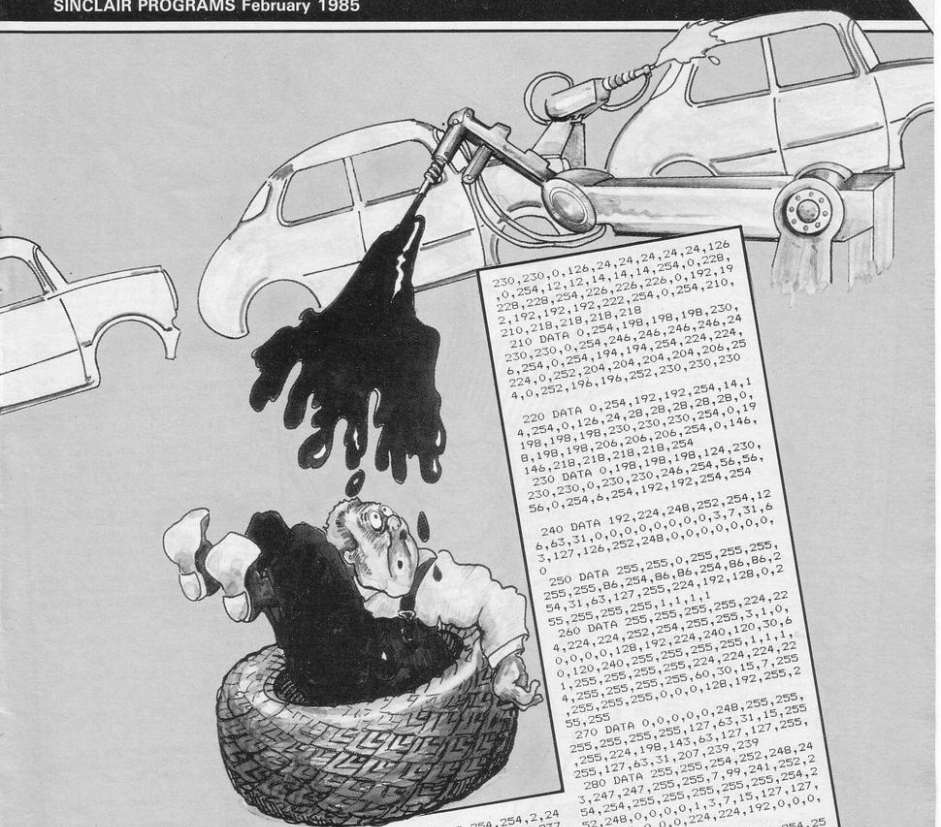
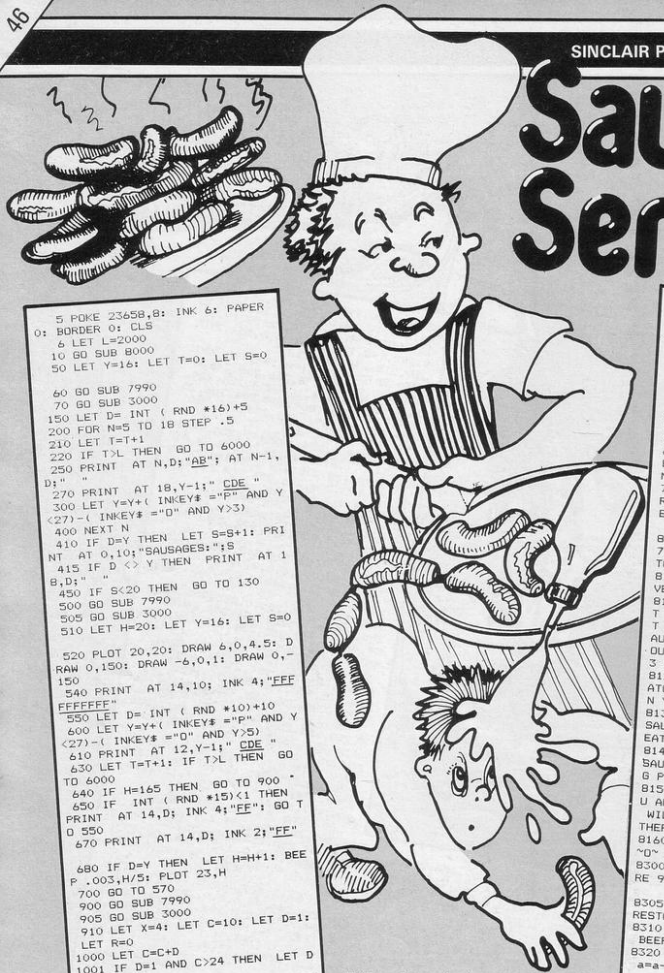


```
7,32,244,28,21,32,232,251,201,20
1
  70 PRINT "POKING IN UDGS"
  80 LET T=0: RESTORE 80: FOR c=
144 TO 155: FOR n=0 TO 7: READ a
: POKE USR CHR$ (c)+n,a: LET T
=T+A: NEXT n: NEXT c: IF T <> 96
05 THEN GO TO 9000: DATA 31,63,
63,0,63,60,63,63,192,224,252,0,1
28,224,224,128,63,0,63,96,236,23
6,230,227,128,0,128,224,112,120,
120,120,224,127,59,59,59,59,61,6
2,112,192,0,0,0,128,192,224
  90 DATA 3,7,63,0,1,7,7,1,248,2
52,252,0,252,60,252,252,1,0,1,7,
14,30,30,252,0,252,6,55,55,10
3,199,14,3,0,0,0,0,1,3,7,254,220
,220,220,220,188,124
 100 PRINT "POKING IN CHARACTER
SET"
 110 LET T=0: RESTORE 110: FOR N
=64600 TO 65367: READ A: POKE N,
A: LET T=T+A: NEXT N: IF T <> 10
4094 THEN GO TO 9000
 120 DATA 0,0,0,0,0,0,0,0,24,2
4,24,24,0,24,24,0,36,36,0,0,0,0,
0,1,3,7,15,31,63,127,255,128,192
,224,240,248,252,254,255
 130 DATA 24,60,126,126,126,60,2
4,24,24,24,24,255,255,255,255,25
5,0,0,0,0,0,7,15,31,0,0,0,0,0,22
4,240,248,63,127,0,127,63,31,15,
7
 140 DATA 0,248,252,254,254,2,24
8,86,237,237,237,237,237,237
,237,0,0,0,0,0,8,8,16,0,255,255,
255,255,0,255,85,0,0,0,0,0,0,24,24
,0
 150 DATA 213,255,213,213,255,21
3,213,255,0,254,198,198,230,230,
230,254,0,48,48,48,56,56,56,56,0
,254,6,6,254,224,224,254,0,254,6
,6,254,14,14,254,0,198,198,198,2
54,14,14,14,0,254,192,192,254,14
,14,254,0,254,192,192,254,230,23
0,254
 160 DATA 0,254,6,6,14,14,14,14,
0,254,206,206,254,198,198,254,0,
254,198,198,254,14,14,254,0,0,24
,24,0,0,24,24,204,204,204,204,20
4,204,204,204,252,254,0,254,252,
248,240,224
 170 DATA 0,0,126,126,0,126,126,
0,0,63,127,255,255,0,63,213,85,2
55,85,85,255,85,85,255,255,254,2
52,248,240,224,192,128,0,254,198
,198,254,198,198,254
 180 DATA 0,254,192,192,224,224,
224,254,0,254,226,226,226,226,22
6,254,0,254,192,192,254,224,224,
254,0,254,192,192,254,224,224,22
4,0,254,198,192,238,230,230,254
 200 DATA 0,198,198,198,254,230,
230,230,0,126,24,24,24,24,24,126
,0,254,12,12,14,14,14,254,0,228,
228,228,254,226,226,226,0,192,19
2,192,192,192,222,254,0,254,210,
210,218,218,218,218
 210 DATA 0,254,198,198,198,230,
230,230,0,254,246,246,246,246,24
6,254,0,254,246,246,246,224,224,
224,0,252,204,204,204,204,206,25
4,0,252,196,196,252,230,230,230

 220 DATA 0,254,192,192,254,14,1
4,254,0,126,24,28,28,28,28,28,0,
198,198,198,230,230,230,254,0,19
8,198,198,206,206,206,254,0,146,
148,218,218,218,218,254
 230 DATA 0,198,198,198,198,124,230,
230,230,0,230,230,246,254,56,56,
56,0,254,6,254,192,192,254,254

 240 DATA 192,224,248,252,254,12
6,63,31,0,0,0,0,0,0,0,3,7,31,6
3,127,126,252,248,0,0,0,0,0,0,0,0,
0
 250 DATA 255,255,0,255,255,255,
255,255,86,254,86,86,254,86,86,2
54,31,63,127,255,224,192,128,0,2
55,255,255,255,1,1,1,1
 260 DATA 255,255,255,255,255,22
4,224,224,252,254,255,255,3,1,0,
0,0,0,0,128,192,224,240,120,30,6
0,120,240,255,255,255,224,224,22
4,255,255,255,255,255,60,30,15,7,255
,255,255,255,255,0,0,0,128,192,255,2
55,255
 270 DATA 0,0,0,0,0,248,255,255,
255,255,255,255,127,63,31,15,255
,255,224,198,143,63,127,127,255,
255,127,63,31,207,239,239
 280 DATA 255,255,254,252,248,24
3,247,247,255,255,255,255,255,2
54,254,255,255,255,255,255,254,2
52,248,0,0,0,0,0,224,224,192,0,0,0,
65,15,6,0,0,0,224,224,192,0,0,0,
0,0
 290 DATA 7,7,3,0,0,0,0,0,254,25
4,252,240,96,0,0,0,192,192,192,255,2
55,192,192,239,239,0,192,192,255,3,3
,239,239,239,0,192,192,3,3,3,255,255,3,3
,3,255,127,63,31,15,7,3,1,248,25
2,126,127,63,31,7,3,0,8,8,8,8,8,8
 300 DATA 31,63,126,254,252,248,
224,192,0,20,40,0,0,0,0,0,56,56,
16,124,84,56,40,40
 8999 GO TO 9500
 9000 CLS : PRINT "ERROR IN DATA:
PLEASE RE-CHECK AND THEN RUN A
GAIN": STOP
 9500 PRINT "DATA PERFECT:": PRIN
T "NOW SAVE THE CODE DIRECTLY AF
TERTHE BASIC"
 9510 LET S$="ASSEMBLY": LET S$=S
$+ CHR$ 202: LET S$=S$+ CHR$ 175
: SAVE S$ CODE 64000,1535
 9600 PRINT "NOW VERIFY THE CODE"
: VERIFY "" CODE
 9610 PRINT "NOW, JUST TO BE SAFE
SAVE THIS PROGRAM": SAVE "M/C"
 9620 PRINT "NOW VERIFY": VERIFY
""
 9900 PRINT "NOW TYPE RANDOMIZE U
SR 0, NEWINDCASSETTE, TYPE LOAD
"""" AND PLAY TAPE"
```

Sausage Server

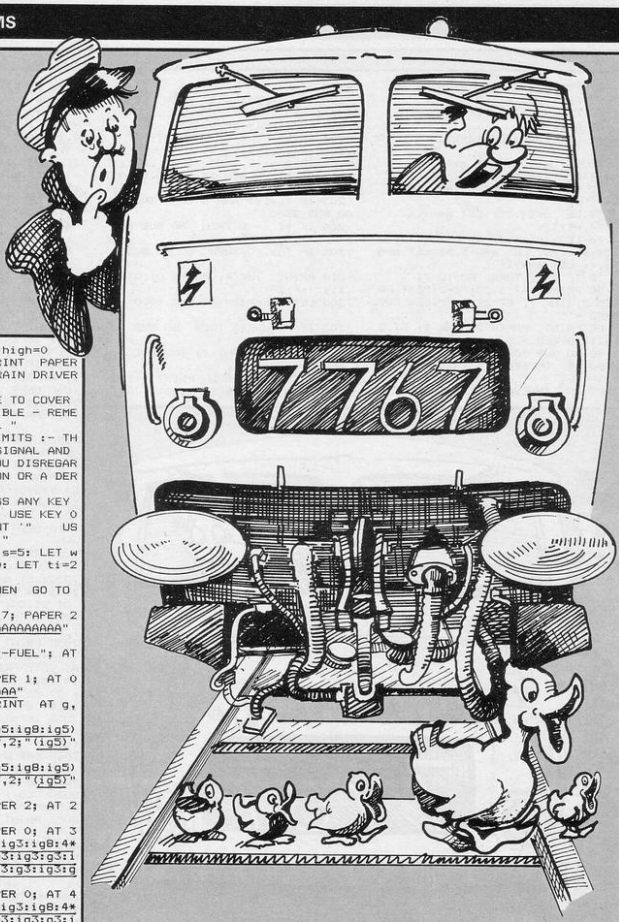


```
  5 POKE 23658,8: INK 6: PAPER
0: BORDER 0: CLS
  6 LET L=2000
 10 GO SUB 8000
 50 LET Y=16: LET T=0: LET S=0

 60 GO SUB 7990
 70 GO SUB 3000
150 LET D= INT ( RND *16)+5
200 FOR N=5 TO 18 STEP .5
210 LET T=T+1
220 IF T>L THEN  GO TO 6000
250 PRINT  AT N,D;"AB"; AT N-1,
D;"  "
270 PRINT  AT 18,Y-1;" CDE  "
300 LET Y=Y+( INKEY$ ="P" AND Y
<27)-( INKEY$ ="O" AND Y>3)
400 NEXT N
410 IF D=Y THEN  LET S=S+1: PRI
NT  AT 0,10;"SAUSAGES:";S
415 IF D <> Y THEN  PRINT  AT 1
8,D;"  "
450 IF S<20 THEN  GO TO 130
500 GO SUB 7990
505 GO SUB 3000
510 LET H=20: LET Y=16: LET S=0

520 PLOT 20,20: DRAW 6,0,4.5: D
RAW 0,150: DRAW -6,0,1: DRAW 0,-
150
540 PRINT  AT 14,10; INK 4;"FFF
FFFFFF"
550 LET D= INT ( RND *10)+10
600 LET Y=Y+( INKEY$ ="P" AND Y
<27)-( INKEY$ ="O" AND Y>5)
610 PRINT  AT 12,Y-1;" CDE  "
630 LET T=T+1: IF T>L THEN  GO
TO 6000
640 IF H=165 THEN  GO TO 900
650 IF  INT ( RND *15)<1 THEN
PRINT  AT 14,D; INK 4;"FF"; GO T
O 550
670 PRINT  AT 14,D; INK 2;"FF"

680 IF D=Y THEN  LET H=H+1: BEE
P .003,H/5: PLOT 23,H
700 GO TO 570
900 GO SUB 7990
905 GO SUB 3000
910 LET X=4: LET C=10: LET D=1:
LET R=0
1000 LET C=C+D
1001 IF D=1 AND C>24 THEN  LET D
=-1
1002 IF D=-1 AND C<7 THEN  LET D
=1
1010 PRINT  AT 14,C-1;" CD  "
1100 IF  INKEY$ ="Z" AND R=0 THE
N  LET R=1: LET X=4
1110 IF R=1 THEN  LET X=X+1: IF
X=14 AND C=15 OR X=14 AND C+1=15
 OR X=14 AND C-1=15 THEN  LET S=
S+1: PRINT  AT X-1,15;"  ": LET
R=0: BEEP .01,30: LET X=4: PRINT
  AT 2,10;"SAUSAGES:";S
1120 PRINT  AT X,15;"AB"; AT X-1
,15;"  "
1130 IF X>19 THEN  LET R=0: PRIN
T  AT X,15;"  ": LET X=4
1150 IF S=20 THEN  GO TO 2000
1170 LET T=T+1: IF T>L THEN  GO
TO 6000
1200 GO TO 950
2000 FOR N=1 TO 10: BEEP .2,N-3:
 BEEP .2,N-10: BEEP .2,N-6: NEXT
 N: CLS : PRINT "THAT'S ONE SATI
SFIED CUSTOMER    OUT OF THE WAY
```

You have just opened a snack bar and your first customer has ordered twenty sausages. There are three cooking stages to complete before the sausages are ready. The three stages involve catching the sausages in a frying pan, heating them up and dropping them onto the moving plate. Remember, if you take too long your customer will leave.

Sausage Server was written for the 16K Spectrum by John Lonsdale of West Ferry, Dundee.

```
..."'''"BUT ANOTHER HAS JUST COME
 IN ANDHAS ALSO ORDERED 20 SAUSA
GES !  YOU WILL HAVE TO GO MORE
QUICKLYIF YOU WANT TO PLEASE THI
S ONE!!": FOR N=1 TO 400: NEXT N
: LET L=L-100: CLS : GO TO 50
3000 PLOT 0,0: DRAW 0,175: DRAW
255,0: DRAW 0,-175: DRAW -255,0:
 RETURN
6000 CLS : PRINT  AT 10,10; FLAS
H 1;"GAME OVER"; AT 20,6; FLASH
8;"YOU RAN OUT OF TIME"
6010 FOR N=30 TO -20 STEP -3: BE
EP .1,N: BEEP .1,N+1: NEXT N: RU
N
7990 CLS : PRINT  AT 10,10;"GET
READY": FOR N=1 TO 3: PAUSE 5: B
EEP .3,30: NEXT N: CLS : RETURN

8000 FOR n= USR "a" TO  USR "F"+
7: READ a: POKE n,a: NEXT n: RES
TORE 9100
8100 PRINT  AT 0,8;"SAUSAGE SER
VER"; AT 2,9;"BY J.LONSDALE"
8110 PRINT  AT 4,0;"YOU HAVE JUS
T OPENED A SNACK BARAND YOU FIRS
T CUSTOMER HAS          ORDERED 20 S
AUSAGES. TO PREPARE HIS DINNER Y
OU MUST COMPLETE        EACH OF THE
3 COOKING STAGES!"
8120 PRINT  AT 10,0;"STAGE 1 : C
ATCH THE SAUSAGES                I
N YOU FRYING PAN"
8130 PRINT '"STAGE 2 : HEAT THE
SAUSAGES ON              THE RED H
EATING BLOCKS"
8140 PRINT '"STAGE 3 : DROP THE
SAUSAGES ONTO            THE MOVIN
G PLATE !"
8150 PRINT '"REMEMBER THAT IF YO
U ARE NOT    QUICK YOUR CUSTOMER
 WILL BECOME ANGRY AND GO TO AND
THER BAR!"
8160 PRINT #1;"  RIGHT-~P~  LEFT-
~O~  DROP-~Z~"
8300 READ a: IF a=99 THEN  RESTO
RE 9100: PAUSE 500: GO TO 8300

8305 IF  INKEY$ = CHR$ 13 THEN
RESTORE 9100: CLS : RETURN
8310 IF a>100 THEN  LET a=a-100:
 BEEP .2,a: GO TO 8300
8320 IF a>50 AND a<100 THEN  LET
 a=a-50: BEEP .4,a: GO TO 8300

8330 BEEP .1,a
8350 GO TO 8300
9000 DATA 0,64,224,206,63,63,31,
15
9005 DATA 0,0,6,63,255,254,252,2
48
9010 DATA 0,0,0,128,192,127,63,0

9015 DATA 0,0,0,1,3,254,252,0
9020 DATA 0,0,3,62,240,128,0,0

9030 DATA 0,0,0,255,255,255,0,0

9100 DATA 104,104,104,104,104,4,
5,57,105,105,102,102,57,57
9110 DATA 104,104,104,104,104,4,
5,57,105,105,104,104,50,99
9999 SAVE "SOS SERVER" LINE 1: P
RINT "REWIND TAPE:SWAP LEADS"'"P
RESS PLAY TO VERIFY": VERIFY "":
 PRINT  FLASH 1;"OK": PAUSE 100:
 RUN
```



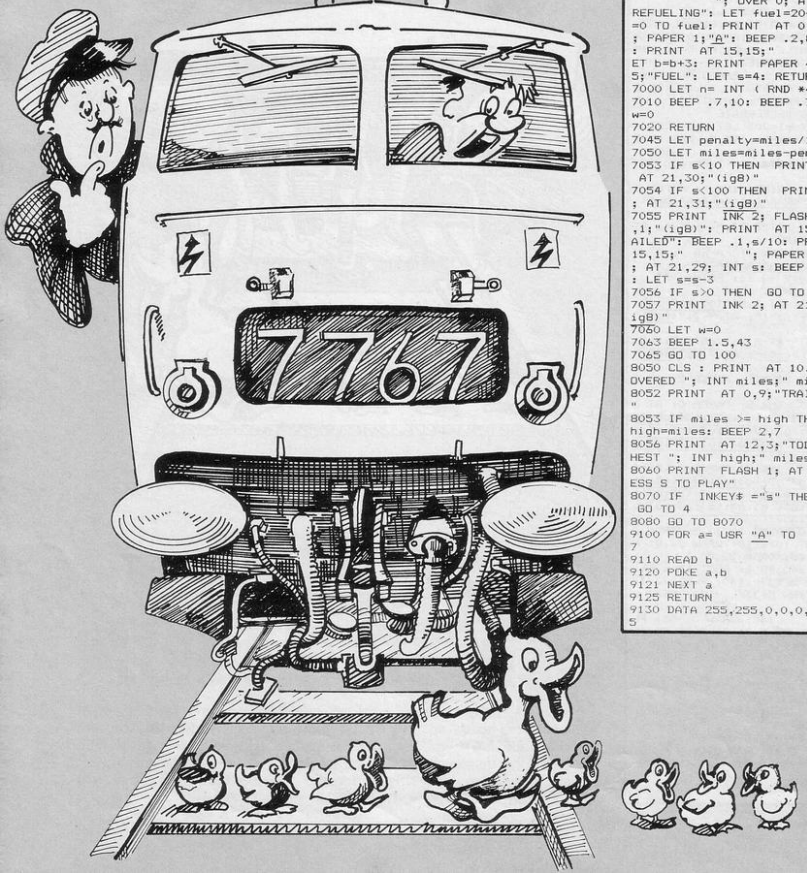

```
  1 GO SUB 9050: LET high=0
  4 PAPER 4: CLS : PRINT  PAPER
1; INK 7;"              TRAIN DRIVER
"
  5 PRINT '"YOU HAVE TO COVER
AS MANY MILES AS POSSIBLE - REME
MBER TO STOP  FOR FUEL "
  6 PRINT '"SPEED LIMITS :- TH
ESE ARE DISPLAYED ON SIGNAL AND
MUST BE OBAYED - IF YOU DISREGAR
D LIMITS MILE REDUCTION OR A DER
AILMENT COULD RESULT"
  7 PRINT '"     PRESS ANY KEY
TO START": PRINT '"    USE KEY 0
 TO ACCELERATE ": PRINT '"    US
E KEY 1 TO DECELERATE "
  10 LET fuel=20: LET s=5: LET w
=0: LET miles=0: INK 0: LET ti=2
0: LET b=4
  25 IF  INKEY$ ="" THEN  GO TO
25
  26 CLS : PRINT  INK 7; PAPER 2
; AT 1,0;"AAAAAAAAAAAAAAAAAAAA"

  27 PRINT  AT 0,23;"<-FUEL"; AT
1,23;"<-TIME"
  28 PRINT  INK 7; PAPER 1; AT 0
,0;"AAAAAAAAAAAAAAAAAAAA"
  30 FOR g=9 TO 16: PRINT  AT g,
1;"(ig8)": NEXT g
  31 PRINT  AT 8,0;"(g5:ig8:ig5)
"; AT 9,0;"(g5)"; AT 9,2;"(ig5)"

  32 PRINT  AT 6,0;"(g5:ig8:ig5)
"; AT 7,0;"(g5)"; AT 7,2;"(ig5)"

  33 PRINT  INK 0; PAPER 2; AT 2
,0;"(32*g3)"
  34 PRINT  INK 2; PAPER 0; AT 3
,0;"(g3:ig3:g3:ig3:g3:ig3:ig8:4*
sp:ig8:g3:ig3:g3:ig3:g3:ig3:g3:i
g3:g3:ig3:g3:ig3:g3:ig3:g3:ig3:g
3:ig3:g3:ig3)"
  35 PRINT  INK 2; PAPER 0; AT 4
,0;"(g3:ig3:g3:ig3:g3:ig3:ig8:4*
sp:ig8:g3:ig3:g3:ig3:g3:ig3:g3:i
g3:g3:ig3:g3:ig3:g3:ig3:g3:ig3:g
3:ig3:g3:ig3)"
  36 INK 0: PLOT 117,115: DRAW 0
,-50: PLOT 107,110: DRAW 20,0: P
LOT 107,100: DRAW 20,0
  37 FOR x=0 TO 6: PLOT 15-x,0:
DRAW  INK 5;55+x,140: PLOT 73,14
0: DRAW  INK 5;37+x,-140: NEXT x

  39 PLOT 30,140: DRAW 0,-55: PL
OT 20,130: DRAW 20,0: PLOT 20,12
0: DRAW 20,0
  40 DIM z(4)
  41 LET z(1)=120
  42 LET z(2)=125
  43 LET z(3)=130
  44 LET z(4)=140
  50 LET j=68
  51 FOR x=135 TO 0 STEP -2
  52 PLOT 0,x: DRAW j,0
  53 LET j=j-.8
  54 NEXT x
  55 LET j=182
```

TRAIN SIMULATION

Cover as many miles of track as possible, stopping for fuel when instructed to do so. The speed limits are displayed by signals and should be obeyed. If you disregard the limits you could be faced with mile reduction or a derailment. Use 0 to accelerate and 1 to slow down.

Train Simulation was written for the 16K Spectrum by Steve and Marc Sherratt of Newquay, Cornwall.

```
 56 FOR x=135 TO 0 STEP -2
 57 PLOT 255,x: DRAW -j,0
 58 LET j=j-.55
 59 NEXT x
 69 LET z=15: LET d=25: LET e=0

 70 LET w=120: LET q=4
 71 FOR x=z TO d
 72 PLOT q,x: DRAW  INK 1;w,0

 73 LET q=q+.35: LET w=w-.67
 74 NEXT x
 76 LET z=(z+16)-e: LET d=(d+15
.5)-e*1.08: LET w=w-5.5: LET q=q
+3.4: LET e=e+1
 78 IF e<11 THEN  GO TO 71
 80 PRINT  AT 1,23;"<-TIME"; PA
PER 2; INK 7; AT 21,0;"MILES COV
ERED = "
 82 PRINT  PAPER 2; INK 7; AT 2
1,21;"SPEED = "
 90 GO SUB 7000
100 IF  INKEY$ ="" THEN  LET a=
-.3
102 IF  INKEY$ ="0" THEN  LET a
=3.5
104 IF  INKEY$ ="1" THEN  LET a
=-1.6
200 LET fuel=fuel-.1
201 PRINT  INK 2; PAPER 7; AT 0
,fuel;"(i<;i-) "
202 IF fuel<7 THEN  BEEP .001,f
uel: PRINT  FLASH 1; PAPER 5; AT
 0,19;"STOP FOR FUEL"
203 IF fuel<7 AND s <= 0 THEN
GO SUB 2500
204 IF ti <= 0 THEN  GO SUB 805
0
205 IF fuel<0 THEN  GO TO 8050

210 PRINT  INK 4; PAPER 0; AT 1
,ti;"(i<;i-) "
300 LET rand= INT ( RND *400)

302 IF rand>385 THEN  GO SUB 70
00
389 PRINT  BRIGHT 1; INVERSE 1;
AT 10,0;z(n)
395 IF s>z(n) THEN  PRINT ; INK
6; FLASH 1; AT 9,1;"(ig8)"; AT
7,1; PAPER 0;" "; LET w=w+1: BEE
P .006,50
396 IF s<z(n) THEN  PRINT  BRIG
HT 1; INK 4; AT 7,1;"(ig8)"; AT
9,1; PAPER 0;" "
397 IF fuel<7 THEN  PRINT  INK
2; FLASH 1; AT 9,1;"(ig8)"
399 IF s>z(n) THEN  LET miles=m
iles-2
400 PRINT  PAPER 2; INK 7; AT 2
1,16; INT miles
401 LET miles=miles+.002+s/100

403 IF w>10 THEN  GO SUB 7045

1000 LET ti=ti-.05: LET s=s+.2+a

1010 IF s<0 THEN  LET s=0
1050 PRINT  PAPER 2; INK 7; AT 2
1,29; INT s
1051 IF s<100 THEN  PRINT  PAPER
 2; AT 21,31;" "
1052 IF s<10 THEN  PRINT  PAPER
2; AT 21,30;"  "
1060 BEEP .01,s/3
2000 GO TO 100
2500 PRINT  PAPER 7; AT 0,19;"
                ": OVER 0; AT 15,15;"
REFUELING": LET fuel=20-b: FOR t
=0 TO fuel: PRINT  AT 0,t; INK 7
; PAPER 1;"A": BEEP .2,8: NEXT t
: PRINT  AT 15,15;"             ": L
ET b=b+3: PRINT  PAPER 4; AT 0,2
5;"FUEL": LET s=4: RETURN
7000 LET n= INT ( RND *4)+1
7010 BEEP .7,10: BEEP .7,5: LET
w=0
7020 RETURN
7045 LET penalty=miles/10
7050 LET miles=miles-penalty
7053 IF s<10 THEN  PRINT  INK 2;
 AT 21,30;"(ig8)"
7054 IF s<100 THEN  PRINT  INK 2
; AT 21,31;"(ig8)"
7055 PRINT  INK 2; FLASH 1; AT 9
,1;"(ig8)": PRINT  AT 15,15;"DER
AILED": BEEP .1,s/10: PRINT  AT
15,15;"             "; PAPER 2; INK 7
; AT 21,29; INT s: BEEP .05,s/10
: LET s=s-3
7056 IF s>0 THEN  GO TO 7053
7057 PRINT  INK 2; AT 21,29;"(3*
ig8)"
7060 LET w=0
7063 BEEP 1.5,43
7065 GO TO 100
8050 CLS : PRINT  AT 10,7;"YOU C
OVERED "; INT miles;" miles "
8052 PRINT  AT 0,9;"TRAIN DRIVER
"
8053 IF miles >= high THEN  LET
high=miles: BEEP 2,7
8056 PRINT  AT 12,3;"TODAYS FURT
HEST "; INT high;" miles"
8060 PRINT  FLASH 1; AT 16,9;"PR
ESS S TO PLAY"
8070 IF  INKEY$ ="s" THEN  CLS :
 GO TO 4
8080 GO TO 8070
9100 FOR a= USR "A" TO  USR "A"+
7
9110 READ b
9120 POKE a,b
9121 NEXT a
9125 RETURN
9130 DATA 255,255,0,0,0,0,255,25
5
```



Dear Diary

I suppose that the likeliest person to read this Diary is some scholar of the future engaged in writing my Life Story. Sometimes it occurs to me that you (if I may address you directly, sir) might somehow have the idea that I don't know much about programming.

THIS IS NOT TRUE.

To prove it, I decided to start a week early and write this month's problem page for Sinclair Programs without any interference from my obnoxious little sister Eustacia. In fact, it was the sight of Eustacia walking home across the park which gave me my subject — I decided to write a minefield program.

It was easy, sir. I hid 20 mines at random X, Y co-ordinates across the screen, holding the values of X and Y in the two arrays XM(20) and YM(20). Eustacia, under control of the cursor keys, had to wander across the screen and be blown up. The routine for checking her position against the position of the mines was

```
10 FOR N=1 TO 20
20 IF (X=XM(N) AND Y=YM(N)) THEN GOSUB 100
30 NEXT N
```

The GOSUB 100 bit, of course, takes you to the explosion routine. In fact, I was just starting to tackle the difficult problem (for most people, sir) of getting a really satisfying sound for this explosion when I noticed that Eustacia was remarkably slow at deciding whether or not she'd stood on a mine.

I thought about this for several days. Today I decided that the solution was to tackle my sister in person; it was sort of her fault, after all.

Leaning against the poser-infested walls of her bedroom, I got my ears bent with the usual Eustacia jargon. By complete accident, she managed to remind me of a couple of tricks I'd decided were too boring to use.

For example, if the character at location X, Y has a code between 32 and 127 (see Appendix A in the Spectrum manual), then SCREEN$ will identify it. So if your mines are represented by M, then.

```
10 IF SCREEN$ (Y, X)="M" THEN GOSUB 100
```

can replace lines 10 to 30.

ATTR, she happened to mention, is even better — because a programmer of my skills would usually represent the mines with some fancy user-defined graphic which SCREEN$ wouldn't recognise.

If, for example, this UDG (as we professionals say, sir) is red, flashing, bright and on a black background, then ATTR (X, Y) will be evaluated as 128 (FLASH) + 64 (BRIGHT) + 8*0 (BLACK PAPER) + 2 (RED INK) = 194.

So

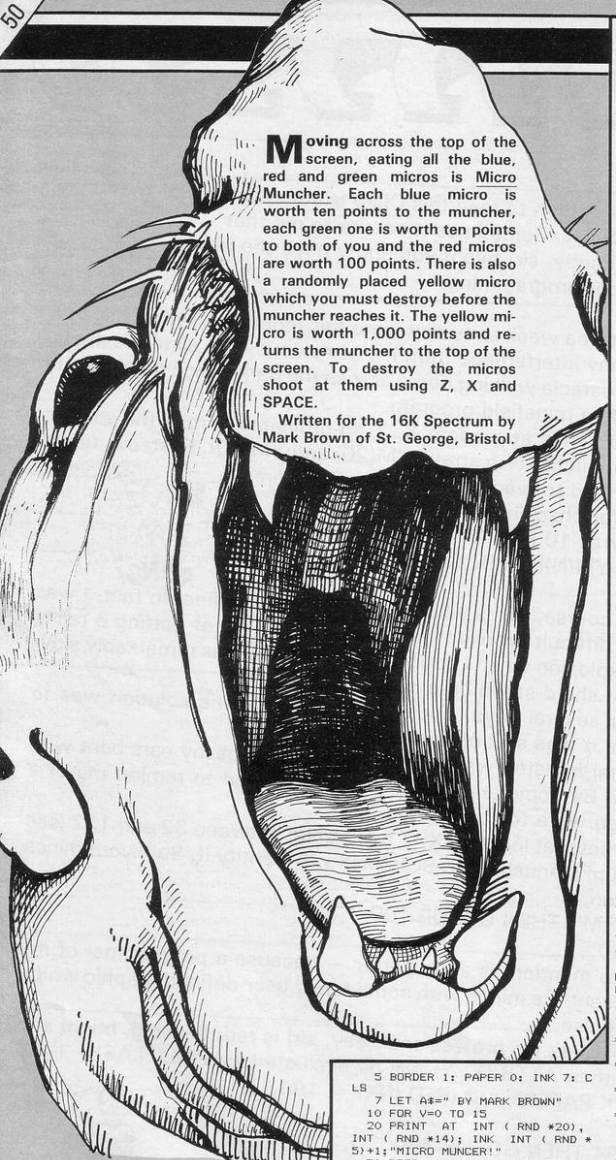
```
10 IF ATTR (Y, X) = 194 THEN GOSUB 100
```

will do the trick.

You will hardly believe it, but Eustacia then demanded to be paid for her contributions.

Tell me, sir. Do they have such things as sisters in your advanced society?

Sid.



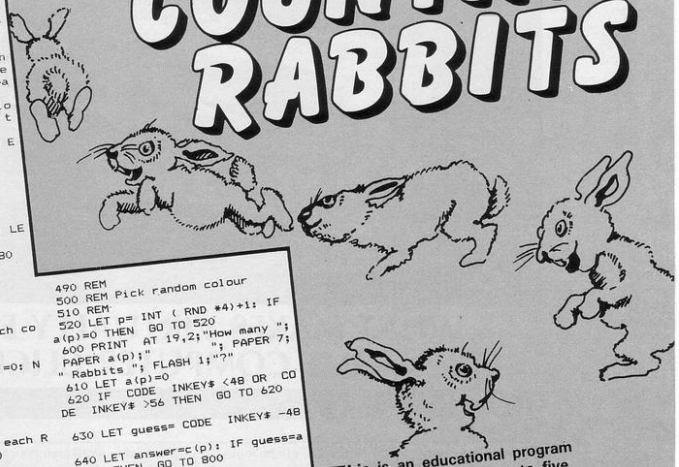
MICRO MUNCHER

Moving across the top of the screen, eating all the blue, red and green micros is Micro Muncher. Each blue micro is worth ten points to the muncher, each green one is worth ten points to both of you and the red micros are worth 100 points. There is also a randomly placed yellow micro which you must destroy before the muncher reaches it. The yellow micro is worth 1,000 points and returns the muncher to the top of the screen. To destroy the micros shoot at them using Z, X and SPACE.

Written for the 16K Spectrum by Mark Brown of St. George, Bristol.

```
  5 BORDER 1: PAPER 0: INK 7: C
LS
  7 LET A$=" BY MARK BROWN"
 10 FOR V=0 TO 15
 20 PRINT AT INT ( RND *20),
INT ( RND *14); INK INT ( RND *
5)+1;"MICRO MUNCER!"
 30 BEEP .05, INT ( RND *20)
 40 NEXT V
 50 PRINT BRIGHT 1; AT 10,7; I
NK INT ( RND *3)+1; INVERSE 1;"
MICRO INVADERS!"
 60 PRINT BRIGHT 1; AT 12,7; I
NK INT ( RND *3)+1; INVERSE 1;A
$
 70 IF NOT LEN A$=14 THEN NE
W
 80 FOR N=0 TO 57
 90 LET J=64401
100 READ A
110 POKE J+N,A
120 NEXT N
130 DATA 6,1,197,33,15,0,17,1,0
,229,205,181,3,225,17,4,0,167,23
7,90,125,254,255,32,237,193,16,2
30,201
131 DATA 6,1,197,33,15,1,17,2,0
,229,205,181,3,225,17,4,0,167,23
7,90,125,254,255,32,237,193,16,2
30,201
133 FOR V=0 TO 31: READ S: POKE
 USR "A"+V,S: NEXT V
134 DATA 0,63,63,63,42,42,42,42
,0,255,255,255,170,170,170,170,0
,248,248,248,168,168,168,168
135 DATA 16,16,56, BIN 01010100
, BIN 10010010, BIN 10010010, BI
N 10101010, BIN 01000100
140 LET C=14
141 LET SC=0: LET SSC=0
142 LET MEN=0
143 LET F=20
145 LET LL=0
146 CLS
147 FOR v=0 TO 30: PRINT AT I
NT ( RND *18),V; INK 4;"(ig8)"

148 PRINT AT INT ( RND *18),V
; INK 2;"(ig8)"; AT INT ( RND *
18),v; INK 1;"(ig8)"; AT INT (
RND *18),v; INK 1;"(ig8)"
149 NEXT v: PRINT AT INT ( RN
D *15)+2, INT ( RND *29)+2; INK
6; FLASH 1;"(ig8)"
150 FOR L=2 TO 17: FOR K=0 TO 3
1
160 PRINT AT L,K; INK 5;" ABC"

161 PRINT AT L,K-1; INK 0;" "
170 PRINT AT 20,C;" D "
180 IF INKEY$ =" " THEN LET L
L=1: LET cc=c
190 IF LL=1 THEN : PRINT AT F,
Cc+1; INK 6;"|": PRINT AT F+1,C
c+1;" ": LET F=F-1
200 IF F=0 THEN LET F=19: LET
LL=0
220 IF ATTR (L,K+4)=4 THEN LE
T SSC=SSC+10: LET DUMMY= USR 644
30
225 IF ATTR (L,K+4)=2 THEN LE
T SSC=SSC+100: LET DUMMY= USR 64
430
226 IF ATTR (L,K+4)=134 THEN
LET SSC=SSC+1000: LET DUMMY= USR
 64430: BORDER 6: BORDER 1: BORD
ER 6: BORDER 2: BORDER 0
227 IF ATTR (L,K+4)=1 THEN LE
T SSC=SSC+10: LET DUMMY= USR 644
30
230 PRINT AT 0,0; INK 6;"SCORE
=";SC;" CHIP SCORE=";SSC
240 IF ATTR (F,C+1)=4 THEN LE
T dummy= USR 64401: LET sc=sc+10
:
241 IF ATTR (F,C+1)=5 THEN LE
T dummy= USR 64401: LET sc=sc+10
0:
242 IF ATTR (F,C+1)=2 THEN LE
T dummy= USR 64401: LET sc=sc+10
0:
243 IF ATTR (F,C+1)=134 THEN
LET sc=sc+1000: FOR v=0 TO 7: FO
R b=0 TO 7: LET dummy= USR 64401
: BORDER b: BORDER b: NEXT b: NE
XT v: BORDER 0: GO TO 147
250 IF INKEY$ ="z" THEN LET c
=c-1
260 IF INKEY$ ="x" THEN LET c
=c+1
280 IF INKEY$ ="X" THEN LET c
=c+2
290 IF INKEY$ ="Z" THEN LET c
=c-2
500 NEXT K: NEXT L
510 IF SC>SSC THEN PRINT AT 0
,0;"YOU WON THE MICRO INVADER"

520 IF SC<SSC THEN PRINT AT 0
,0;"I WON DO DAH"
550 PRINT AT 20,0;"WANT ANOTHE
R GO Y/N?"
560 IF INKEY$ ="y" OR INKEY$
="Y" THEN RUN
570 IF INKEY$ ="n" OR INKEY$
="N" THEN LOAD ""
580 GO TO 560
```

COUNTING RABBITS



```
 50 BORDER 7: PAPER 7: INK 0: B
RIGHT 1: CLS
 60 DIM a(4): DIM c(4)
 70 FOR i=2 TO 6
 80 IF i <> 3 THEN  PRINT  AT i
-1*(i>3),8; INK i;"COUNTING RABB
ITS"
 90 NEXT i
 100 PRINT  AT 12,10; PAPER 2; I
NK 7; FLASH 1;"INITIALISING"
 110 GO SUB 2000
 120 PRINT  AT 7,0;"Teaches the
numbers : 0 to 8    by asking th
e child to count thenumber of ra
bbits of a certain  colour."
 130 PRINT '"The colour in each
question is  shown as a long ban
d enabling  children to use the
 program  before they can rea
d."
 140 PRINT '"To answer a questio
n just press the number keys 0 t
o 8."
 170 PRINT  AT 21,0;"Press the E
NTER key to continue"
 180 INPUT  LINE z$
 190 REM
 200 REM Start
 210 REM
 220 CLS
 230 LET xmin=0: LET xmax=30: LE
T sa=0: LET sm=0
 250 FOR d=1 TO 2: RESTORE 280

 260 FOR i=1 TO 4: READ a(i)
 270 NEXT i
 280 DATA 2,4,5,6
 290 REM
 300 REM Reset number of each co
lour to 0
 310 REM
 320 FOR i=1 TO 4: LET c(i)=0: N
EXT i
 330 LET n=0
 340 FOR y=0 TO 12 STEP 4
 350 FOR x=1 TO 25 STEP 6
 390 REM
 400 REM Choose colour of each R
abbit at random (max of 8)
 410 REM
 420 LET colour= INT ( RND *4)+1

 430 LET c(colour)=c(colour)+1:
IF c(colour)>8 THEN  LET c(colou
r)=c(colour)-1: GO TO 420
 440 INK a(colour): PRINT  AT y,
x;"GHIJ"
 450 PRINT  AT y+1,x;"KLMN"
 460 PRINT  AT y+2,x;"OPQR"
 470 NEXT x: NEXT y
 480 INK 0: FOR i=1 TO 100: NEXT
 i
 490 REM
 500 REM Pick random colour
 510 REM
 520 LET p= INT ( RND *4)+1: IF
a(p)=0 THEN  GO TO 520
 600 PRINT  AT 19,2;"How many ";
                    "; PAPER 7;
PAPER a(p);"
" Rabbits "; FLASH 1;"?"
 610 LET a(p)=0
 620 IF  CODE  INKEY$ <48 OR CO
DE  INKEY$ >56 THEN  GO TO 620

 630 LET guess= CODE  INKEY$ -48

 640 LET answer=c(p): IF guess=a
nswer THEN  GO TO 800
 690 REM
 700 REM Guess wrong
 710 REM
 720 PRINT  AT 19,0;"No you got
it wrong there are ";answer;"  "

 730 REM
 740 REM Print a sad face
 750 REM
 760 PRINT  AT 16,xmax;"AB"; AT
17,xmax;"EF"
 770 LET xmax=xmax-3: LET sa=sa+
1
 780 LET w=.1: BEEP 1.5*w,7: BEE
P w,4: BEEP 1.5*w,0: BEEP w,4: B
EEP .8*w,2: BEEP 2*w,2: GO TO 90
0
 790 REM
 800 REM Guess right
 810 REM
 820 PRINT  AT 19,2;"Thats right
there are ";answer;"
 830 REM
 840 REM Print a smiling face
 850 REM
 860 PRINT  AT 16,xmin;"AB"; AT
17,xmin;"CD"
 870 LET xmin=xmin+3: LET sm=sm+
1
 880 LET w=.07: BEEP 3*w,12: BEE
P w,16: BEEP 2*w,14: BEEP w,17:
BEEP 3*w,16: BEEP 5*w,12
 900 FOR u=1 TO 250: NEXT u
 920 PRINT  AT 19,0;"
                    "

 930 LET n=n+1: IF n=4 THEN  GO
TO 1000
 950 GO TO 500
 1000 NEXT d
 1010 PRINT  AT 19,2;"You got ";s
m;" right and ";sa;" wrong
 1020 PRINT  AT 21,2;"Press the E
NTER key to repeat"
 1030 INPUT  LINE z$: GO TO 200
 1040 STOP
 1990 REM
 2000 REM Set graphic characters

 2010 REM
 2020 RESTORE 2040
 2030 FOR i= USR "a" TO  USR "r"+
7
 2040 READ j: POKE i,j
 2050 NEXT i: RETURN
 2060 DATA 7,31,48,96,76,204,192,
193,224,248,12,6,50,51,3,131
 2070 DATA 193,192,216,79,99,48,3
1,7,131,3,27,242,198,12,248,224

 2080 DATA 193,192,195,71,108,48,
31,7,131,3,195,226,54,12,248,224

 2090 DATA 1,3,3,7,7,31,63,115,15
2,152,184,48,112,243,255,255
 2100 DATA 0,0,0,0,0,0,224,248,254,
0,0,0,0,0,0,0,0
 2110 DATA 243,255,251,119,15,0,0
,0,255,223,223,191,127,127,127,2
55
 2120 DATA 255,255,255,255,255,25
1,247,239,0,128,192,192,236,254,
255,255
 2130 DATA 1,15,15,0,0,0,0,0,255,
199,131,0,0,1,7,7
 2140 DATA 223,223,239,239,7,251,
255,255,254,236,224,192,192,192,
128,128
```

This is an educational program for children aged two to five. Twenty rabbits appear on the screen and at the bottom a coloured band is shown. The child is asked how many rabbits are the same colour as the band at the bottom of the screen. As the child can see the colour without having to be able to read and there are never more than eight rabbits of one particular colour the program is suitable for the younger child.

Counting Rabbits was written for the 16K Spectrum by Alan Pratt of Chelmsford, Essex.

WHAT MAKES VIRTUALLY EVERY HOME COMPUTER CLICK?

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SPROGS
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GOOD LUCK WITH TODAYS EVENTS
SPORT
7
OH NO!-THE SOFTWARE PIRATE
HE'S PLANTING A BOMB AT THE END OF THE COURSE- WE MUST STOP HIM
HEH-HEH!
BOMB
THE SPROGS LEAP INTO ACTION
THERE HE GOES
"AND HERE WE SEE A LATE ENTRY FROM THE SPROGS
"A RECORD BREAKING HEIGHT ACHIEVED WITHOUT THE USE OF ANY POLE"
" AND WHAT A THROW!! -TEN.....TWENTY.
..FIFTY.....SIXTY....
PHEW!
BOMB
SCREECH
SNAP
..SEVENTY..
POW!
EIGHTY...NINETY...ONE HUNDRED.
FOR YOUR RECORD-BREAKING PERFORMANCE I AWARD YOU ALL GOLD MEDALS!!
JUDGE
GRRR
PANT
GASP
?
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to his doom
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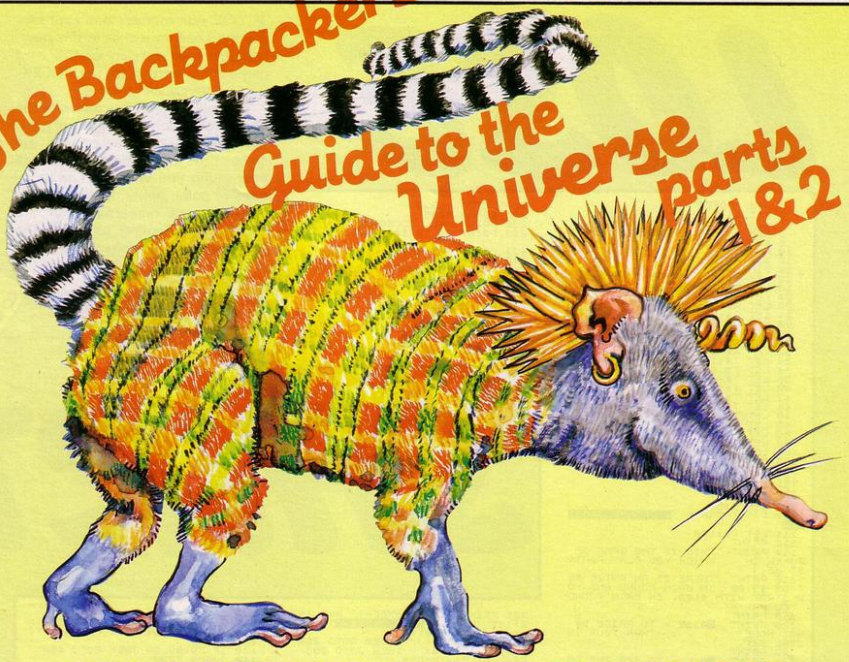
The Backpacker's Guide to the Universe parts 1&2



50 COPIES MUST BE WON

Ziggy, super-hero of Fantasy's games, reappears in the massive, two part game, **The Backpacker's Guide to the universe.** Ziggy has only half a terrestrial day in which to scour the labyrinthine caverns of the planet of Thalis, collect the twelve exotic animals to be found there and return them, unharmed, to the spaceship. Of course, with creatures such as the Fluffflelump, which licks other creatures to death, and the Googly bird, which needs regular doses of tranquillisers in order to stave off a terminal nervous breakdown, to collect, Ziggy needs to invest a lot of thought and planning in his quest before actually moving any of the animals.

How to enter: First, answer the questions below. Then study the animal above. As Ziggy was returning to his space ship for the last time, he found this animal curled up behind the door. Despite extensive searches in the Encyclopedia Galactica, Ziggy has been unable to name it. What do you think the creature is called?

Fill in the competition entry form and post it off to us to arrive before the first of March. The best suggestions included with the correct answers will win.

Employees of EMAP and of Fantasy Software are not eligible to enter. The editor's decision in all matters concerning the competition is final.

1. Name the hero of the Backpacker's Guide. 2. How many creatures must the hero collect?
3. How many hours has the hero in which to complete his quest? 4. What is a 'Backpacker'?
5. Name one other game which Fantasy have produced for the Spectrum.

NAME .....
ADDRESS .....
.....
1 .....
2 .....
3 .....
4 .....
5 .....

I THINK THE CREATURE IS A .....
.....
MY FAVOURITE PROGRAM IS .....
.....
FROM .....
.....
MY MOST HATED PROGRAM IS .....
.....

LOSE Your SHIRT

LOSE your money, lose your sanity, Lose your shirt in this new, computerised version of the card game Poker written for the 16K ZX-81 by Steven Weston.

You will be dealt five cards by the computer which will also deal itself five cards. On the basis of your first sight of the cards you must choose how much you will bet. The usual rules of poker apply. Winning combinations are numerous, but are based on collecting cards of the same face value or the same suite.

```
  1 REM "POKER"
  2 LET S$=""
  3 REM BY STEVEN WESTON 1984
  5 LET BORROW=0
 10 RAND
 12 DIM A$(9,5)
 14 DIM T$(11,5
 16 LET A$(1)="
 18 LET A$(2)="
 20 LET A$(3)="
 22 LET A$(4)="
 24 LET A$(5)="
 26 LET A$(6)="
 28 LET A$(7)="
 30 LET A$(8)="
 32 LET A$(9)="
 34 LET T$(1)="99992"
 36 LET T$(2)="68888"
 38 LET T$(3)="76872"
 40 LET T$(4)="48842"
 42 LET T$(5)="46846"
 44 LET T$(6)="45846"
 46 LET T$(7)="35942"
 48 LET T$(8)="44446"
 50 LET T$(9)="43442"
 52 LET T$(10)="34342"
 54 LET T$(11)="86882"
100 DIM T(13)
101 DIM K(4)
102 DIM M(5)
103 DIM N(5)
104 DIM C(5)
105 DIM D(5)
110 PRINT TAB 8;"  POKER GAME
    "
111 LET P9=100
112 PRINT
114 PRINT "THIS IS THE GAME OF
POKER IN     WHICH YOU PLAY AGAIN
ST ME."
116 PRINT "THERE IS AN ANTIE BE
T OF $5.00 IN EACH ROUND AND YO
U START WITH $100. IN EACH ROUND
 YOU MAY :-"
118 PRINT
120 PRINT "RAISE - TO RAISE BY
NOT MORE          THAN YOUR IN
ITAL BET."
122 PRINT
124 PRINT "CALL - TO SEE THE CO
MPUTERS HAND."
126 PRINT
128 PRINT "GO OUT - TO THROW YO
UR HAND IN."
130 PRINT
132 PRINT "PRESS ANY KEY TO PLA
Y."
134 PRINT
135 PRINT TAB 10;"GOOD LUCK"
136 IF INKEY$()"" THEN GOTO 136
137 IF INKEY$="" THEN GOTO 137
138 CLS
140 DIM S(4,13)
151 PRINT AT 9,0;"THE CARDS HAV
E BEEN RESHUFFLED."
160 LET P9=P9-5
163 PRINT AT 11,9;"ANTE OF $5.0
0"
165 PRINT AT 13,9;"YOU HAVE $";
P9
166 IF P9<=0 THEN GOTO 7000
170 FOR X=1 TO 5
171 GOSUB 920
172 LET M(X)=C
173 LET N(X)=S
174 NEXT X
175 GOSUB 1040
181 PRINT
182 PRINT "ILL DEAL MY HAND....
"
185 FOR X=1 TO 5
190 PRINT "     ";
    ";
191 GOSUB 920
192 LET C(X)=C
193 LET D(X)=S
194 NEXT X
195 PRINT "  ";
  ";"S";"  ";
196 PRINT AT 19,0;"YOU HAVE $";
P9-5
200 GOSUB 1080
201 LET C1=T
202 LET C2=H9
203 LET P1=T
211 PRINT AT 21,0;"OPEN WITH A
BET: (0-";P9-5;")"
212 INPUT BET
213 IF BET<0 OR BET>P9-5 THEN G
OTO 210
214 LET B=BET
215 IF RND<.8 THEN GOTO 230
220 IF INT ((((T*RND)+1)+((H9+RN
D)+1)*(T+10))<(BET-(BET/10) THEN
GOTO 440
230 LET A9=A9+B
231 GOSUB 5025
232 PRINT "ILL ACCEPT."
233 PRINT AT 19,10;P9-5-BET;"
234 LET STAKE=BET
240 GOSUB 5000
241 PRINT "HOW MANY CARDS TO RE
PLACE?"
242 IF INKEY$()"" THEN GOTO 242
243 IF INKEY$="" THEN GOTO 243
244 LET E$=INKEY$
245 IF E$<"0" OR E$>"3" THEN GO
TO 242
246 LET K9=VAL E$
250 FOR X=1 TO K9
260 GOSUB 5025
261 PRINT "CARD NUMBER?" AND (X
/2<INT (X/2));"  ";"
262 IF INKEY$()"" THEN GOTO 262
263 IF INKEY$="" THEN GOTO 263
264 LET E$=INKEY$
265 IF E$<"0" OR E$>"9" THEN GO
TO 262
266 LET T9=VAL E$
267 PRINT E$
268 GOSUB 920
270 IF T9<6 THEN GOTO 280
271 GOSUB 5000
272 PRINT "ENTER CARD NO. (1-5
ONLY)."
273 GOTO 260
280 LET M(T9)=C
281 LET N(T9)=S
282 NEXT X
283 GOSUB 1044
290 GOSUB 1070
291 FOR X=1 TO 5
292 LET T(M(X))=T(M(X))+1
293 LET K(N(X))=K(N(X))+1
294 NEXT X
295 GOSUB 5025
296 PRINT "I'M THINKING....."
301 GOSUB 640
302 LET P1=T
303 GOSUB 800
304 LET P2=H9
311 GOSUB 1080
312 LET H9=0
313 IF T>3 THEN GOTO 350
320 FOR Z=1 TO 5
321 IF H9>3 THEN GOTO 340
322 IF T*C(Z)>1 THEN GOTO 340
323 LET H9=H9+1
330 GOSUB 920
331 LET C(Z)=C
332 LET D(Z)=S
340 NEXT Z
350 GOSUB 5025
351 PRINT "ILL TAKE ";H9;" CARD
(S)" AND H9>1;".";"
352 LET H5=H9
360 GOSUB 1080
361 LET C1=T
362 GOSUB 800
363 LET C2=H9
370 LET B9=INT ((C1+RND)+(C2+RN
D)+(C1*10))+INT (A9/3)+((K9-H8)*
2)
380 LET B1=0
382 IF RND<.C1+.5 THEN GOTO 390
383 LET B9=99.99
390 GOSUB 5000
391 GOSUB 6000
401 IF B<0 THEN GOTO 570
402 LET A9=A9+B1
410 IF B1>0 THEN GOTO 420
411 GOSUB 480
412 GOTO 540
420 IF A9+B<B9 THEN GOTO 460
421 IF A9+B<B9+(B9/2) THEN GOTO
450
430 IF B9=99.99 THEN GOTO 450
440 GOSUB 5000
441 PRINT "I'M OUT....."
443 GOTO 580
450 GOSUB 5000
451 PRINT "I CALL."
452 LET A9=A9+B
453 GOSUB 480
454 GOTO 540
460 LET B1=INT (((B9-A9)/3)*RND
)
461 LET A9=A9+B
470 GOSUB 5000
471 PRINT "I RAISE $";B1
472 GOTO 390
480 GOSUB 4000
481 GOSUB 1044
482 GOSUB 5000
483 PRINT "I HAD ";
484 LET T=C1
485 GOSUB 820
490 GOSUB 5000
491 PRINT "WITH A HIGH CARD OF
";
492 LET C=C2
493 GOSUB 840
494 PRINT "."
500 IF P1=5 THEN GOTO 530
510 GOSUB 5000
511 PRINT "YOU HAD ";
512 LET T=P1
513 GOSUB 820
520 GOSUB 5000
521 PRINT "WITH A HIGH CARD OF
";
522 LET C=P2
523 GOSUB 840
524 PRINT "."
531 RETURN
540 IF C1<P1 THEN GOTO 550
541 IF C1<P1 THEN GOTO 580
542 GOTO 570
550 IF C2=P2 THEN GOTO 560
551 IF C2<P2 THEN GOTO 580
552 GOTO 570
560 GOSUB 5000
561 PRINT "IT WAS A TIE...."
562 GOTO 590
570 GOSUB 5000
571 PRINT "I WON ";A9
572 LET P9=P9-A9
573 GOTO 590
580 GOSUB 5000
581 PRINT "YOU WON $";A9
582 LET P9=P9+A9
590 GOSUB 5000
592 PRINT "ANOTHER GO? (YES OR
```

```
  0)?"
  593 IF INKEY$<>"" THEN GOTO 593
  594 IF INKEY$="" THEN GOTO 594
  595 IF INKEY$="Y" THEN GOTO 138
  596 CLS
  597 LET P9=P9-(BORROW*100)
  598 SCROLL
  599 PRINT "
  600 IF P9<0 THEN GOTO 630
  610 IF P9>=100 THEN GOTO 620
  611 SCROLL
  612 PRINT "YOU LEFT LOSING $";1
00-P9
  613 SCROLL
  614 SCROLL
  615 PRINT "
  616 GOTO 635
  620 SCROLL
  621 PRINT "YOU LEFT WINNING $";
P9
  622 SCROLL
  623 SCROLL
  624 PRINT "
  625 GOTO 635
  630 SCROLL
  631 PRINT "YOU OWE ME $";-P9
  632 SCROLL
  633 SCROLL
  634 PRINT "
  635 SCROLL
  636 SCROLL
  637 SCROLL
  638 STOP
  640 LET T=0
  641 FOR I=1 TO 4
  642 IF K(I)<5 THEN GOTO 650
  643 LET T=5
  650 NEXT I
  651 LET I=2
  652 LET H9=0
  660 LET I=I-1
  661 IF T(I)<0 THEN GOTO 670
  662 LET I=13
  670 IF T(I)<1 THEN GOTO 660
  671 LET H9=I
  672 IF I<>1 THEN GOTO 680
  673 LET I=14
  680 LET Z=I-4
  690 LET I=I-1
  691 IF T(I)<>1 THEN GOTO 720
  700 IF Z<>1 THEN GOTO 690
  710 LET T=T+4
  711 IF Z<>10 THEN GOTO 720
  712 IF T=4 THEN GOTO 170
  713 LET T=T+1
  720 IF I=13 THEN GOTO 660
  721 IF I<5 THEN GOTO 730
  722 IF T(I)<>1 THEN GOTO 730
  723 LET H9=1
  730 IF T=0 THEN GOTO 740
  731 RETURN
  740 FOR I=1 TO 13
  741 IF T(I)<>4 THEN GOTO 750
  742 LET T=7
  750 IF T(I)<>3 THEN GOTO 760
  751 LET T=T+5
  752 LET H9=I
  760 IF T(I)<>2 THEN GOTO 790
  761 IF T=5 THEN GOTO 780
  762 IF T<>0 THEN GOTO 770
  763 LET H9=0
  770 IF H9=1 THEN GOTO 780
  771 IF H9=I THEN GOTO 780
  772 LET H9=I
  780 LET T=T+1
  790 NEXT I
  791 IF T<5 THEN GOTO 810
  792 LET T=3
  793 RETURN
  800 IF H9<>1 THEN GOTO 810
  801 LET H9=14
  810 RETURN
  820 IF T<>0 THEN GOTO 830
  821 PRINT "NOTHING"
  822 RETURN
  830 IF T<>1 THEN GOTO 840
  831 PRINT "ONE PAIR"
  832 RETURN
  840 IF T<>2 THEN GOTO 850
  841 PRINT "TWO PAIRS"
  842 RETURN
  850 IF T<>3 THEN GOTO 860
  851 PRINT "THREE OF A KIND"
  852 RETURN
  860 IF T<>4 THEN GOTO 870
  861 PRINT "A STRAIHT"
  862 RETURN
  870 IF T<>5 THEN GOTO 880
  871 PRINT "A FLUSH"
  872 RETURN
  880 IF T<>6 THEN GOTO 890
  881 PRINT "A FULL HOUSE"
  882 RETURN
  890 IF T<>7 THEN GOTO 900
  891 PRINT "FOUR OF A KIND"
  892 RETURN
  900 IF T<>9 THEN GOTO 910
  901 PRINT "A STRAIGHT FLUSH"
  902 RETURN
  910 PRINT "A ROYAL FLUSH..."
  911 RETURN
  920 LET S=INT (RND*4+1)
  921 LET C=INT (RND*13+1)
  930 IF S(S,C)=1 THEN GOTO 920
  931 LET S(S,C)=1
  932 RETURN
  940 PRINT "A" AND (C=1 OR C=14)
;"T" AND C=10;"J" AND C=11;"Q" A
ND C=12;"K" AND C=13;
  941 IF C>1 AND C<10 THEN PRINT
C;
  942 IF C=1 THEN LET C=14
  943 IF C>10 AND C<14 THEN LET C
=1
  944 IF C=14 THEN LET C=11
  952 RETURN
 1000 PRINT "H" AND S=1;"S" AND S
=2;"D" AND S=3;"C" AND S=4;
 1001 PRINT "
 1002 RETURN
 1040 CLS
 1041 LET LINE=0
 1042 PRINT TAB 7;"HERE IS YOUR H
AND
 1043 PRINT "  1     2     3
4     5"
 1044 FOR X=1 TO 5
 1045 PRINT AT 2+LINE,0;"
 1046 PRINT TAB (X-1)*6;"
AB (X-1)*6;"
 1050 LET C=H(X)
 1051 LET S=N(X)
 1054 GOSUB 940
 1055 GOSUB 1000
 1056 FOR Y=1 TO 5
 1057 PRINT TAB (X-1)*6;A$(VAL T$
(C,Y))
 1058 NEXT Y
 1060 NEXT X
 1061 RETURN
 1070 DIM K(4)
 1071 DIM T(13)
 1072 RETURN
 1080 GOSUB 1070
 1081 FOR X=1 TO 5
 1082 LET T(C(X))=T(C(X))+1
 1090 LET K(D(X))=K(D(X))+1
 1091 NEXT X
 1092 GOSUB 640
 1093 RETURN
 1100 STOP
 4000 FOR Q=1 TO 5
 4010 LET M(Q)=C(Q)
 4020 LET N(Q)=D(Q)
 4030 NEXT Q
 4040 LET LINE=9
 4050 RETURN
 5010 FOR Q=1 TO 25
 5020 NEXT Q
 5025 PRINT AT 21,0;S$;AT 21,0;
 5030 RETURN
 5000 GOSUB 5000
 6005 PRINT "RAISE, CALL OR FOLD
 ?"
 6010 IF INKEY$<>"" THEN GOTO 601
0
 6020 IF INKEY$="" THEN GOTO 6020
 6030 LET E$=INKEY$
 6040 IF E$<>"R" AND E$<>"C" AND
E$<>"F" THEN GOTO 6010
 6050 IF E$="C" THEN LET B=0
 6060 IF E$="F" THEN LET B=-1
 6065 IF E$="C" OR E$="F" THEN GO
TO 6120
 6070 GOSUB 5025
 6080 PRINT "HOW MUCH DO YOU RAIS
E BY?"
 6090 INPUT B
 6100 IF B<BET OR B+STAKE>P9 THEN
 GOTO 6090
 6110 IF B<>0 THEN GOTO 6000
 6114 LET STAKE=STAKE+B
 6115 PRINT AT 19,10;P9-STAKE-5;"
 "
 6120 RETURN
 7000 PRINT
 7010 PRINT "YOU HAVE NO MONEY DO
 YOU WISH    TO BORROW $100? (
ES OR NO)?"
 7020 IF INKEY$<>"" THEN GOTO 702
0
 7030 IF INKEY$="" THEN GOTO 7030
 7040 LET E$=INKEY$
 7050 IF E$<>"Y" THEN GOTO 596
 7060 LET P9=100
 7065 LET BORROW=BORROW+1
 7070 GOTO 138
```

Questline

Cathy Foot faces The Wrath of Magra

STILL exhausted by climbing my way laboriously up the social scale towards **Hampstead** last month it came as something of a shock to be thrust into a world of spells and monsters as I began **The Wrath of Magra** from Mastervision. Having compiled a list of does and don'ts for players last month, I felt no compunction in producing some for games writers this month.

1) Will SOMEONE out there bring out a grammar for games program writers — and a dictionary for the players!

2) Will firms at least allow us to "save" to microdrive — I WOULD like to copy the whole program to microdrive, but I suppose that would increase games pirating. Saving to microdrive would speed up my games no end.

If you like this sort of thing, you DO get good value for money — for instance, there are hieroglyphics on the inner walls of the Wizard's tomb. All I got from investigating the tomb was to be buried in six unmarked graves! This was one area I had not explored with the graphics on — you can translate the hieroglyphics with the aid of the Enchanted Warrior spell in the Book of Shadows. Thanks, MasterVision, both for the various hints you gave me as we discussed Magra and for taking a lot of time and effort yourselves so as to get me into Episode Three.

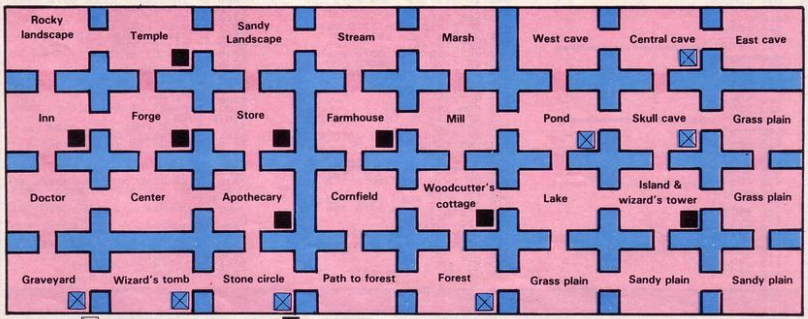
Since I used to be a Gamer (when I had time) I like the Dungeons and Dragons touch, where not everything is revealed if you "look". Along with many other people, though, I would have prefered an 'examine" command, so many games of this type have such that one feels disoriented when told that "examine" is not understood. While it is a good idea to be able to go to a likely spot and look for herbs etc., this program is too slow overall for such frills to be suitably appreciated. Similarly, we are not given any clues as to native habitat of the herbs in this universe. Neither dill nor wolfsbane are mentioned in any of my plant books, and stinging nettles are not to be found in many of their more normal Earth environments.

Yes, the machine will accept multiple instructions but remember to leave a space between commands. "N space N" will move you two map squares North if you can take them. (Having plugged in a programmable joystick my son discovered that NESWNESWNESWNESW ... paused the machine as if it were awaiting a tape input and, since there was none available, the whole program crashed — a pity, since we were just about to risk a trip into Skull Cavern loaded for bear — now does one buy asprin for a computer?)

Spelling mistakes are bad enough in written work, but when you have to use them because they are stored in the program they become frustrating in the extreme — Vipers TOUNGE, for instance, or Death CUP mushrooms, although Mastervision told me that the last is so that even crazier players might not try the "spells" outside the program. Since it takes the machine so long to check for sure that "you can't get that there 'ere" each time, my level of frustration rises as my spelling ability plummets.

Continuing to look at this as computerised Dungeons and Dragons. I see Episode One as the preparation of my character and Episode Two as a first level adventure preparing you to face Magra herself in Episode Three. Yes, it can be improved — there must be some way to speed up the action, for instance — but, even as it stands, you still get a lot for your money. IMPORTANT:- Take your first games slowly if you are new to Magra and find a source of food and water; your character seems to have been through some hard times before reaching the Valley.

They only sell mead and meat



at the inn, and everything for sale costs at least one gold bit. You will find that villagers will not buy things they sell for one gold bit, since they seem keen on making a profit out of you.

If you need a hint, then move the letters in the next lines back by one in the alphabet — tfmm Tjsfot Ibjs up jodsfbtf zpvs wealth in Episode One. vtf ujf Hspx Xjoht tqfmm up jodsfbtf zpus faith in Episode Two).

My first venture into Episode Three lasted exactly three caverns. There I was confronted by a large fire-spitting, furry monster with a long scaley tail — not at all cuddly!

At that point, the gremlins struck again, NEWing out the program, much to my relief, since I was thirsty and backed into a corner.

The message which appears on the screen if your character dies in Episode One is not accurate, continue reloading from the beginning UNTIL THAT MESSAGE LEAVES THE SCREEN — about 100 turns of the counter.

Dislikes:- a) the slow graphics. After the initial mapping run, I would suggest taking advantage of the "no graphics" facility, which speeds things up a lot (just you wait until you reach Episode Two, where every letter calls forth a "beep" from your Spectrum and slows you down no end. Even my son can type in instructions faster than they can be handled and he is still at the "prod" stage of typing). "No Graphics" in Episode Two continues to show you which room you are in, it only fails to draw in any monster there.

b) The need to type in everything in full each time. I KNOW there is a huge vocabulary, but there must be some short cuts for us SOMEWHERE.

I AM impressed by the amount of work and loving care that has gone into episode three. The monsters the machine comes up with have been the sort of thing that any sensible adventurer would tiptoe past, hoping not to be seen. None of them have been other than magnificently offensive. My only hope has been to get in first with a lucky blow.

After my first monster, I met, in quick succession, a bipedal creature with a body covered in green slime which spat out lightning bolts, a giant slithering monster with fiery breath, extending steel jaws and coarse hair, which turned out to be surprisingly vulnerable to my silver sword — on my first meeting I killed it with one lucky blow; on the second it took three rounds before it lay dead at my feet.

In my opinion, however, the moment AFTER you have killed your first monster is where the most delicious terror strikes. As you stand there, thanking your Gods that you have overcome one of the beastly guards of Magra, the computer informs you that Magra is making a new monster.

You have only just penetrated her fortress and already she knows you are there! Can you still win through? As one already stricken in the fray, my best wishes go with you, adventurer, and may you succeed where I failed!

To: Questline, Sinclair Programs,
67 Clerkenwell Road, London EC1R 5BH

From: .....

.....

HELP OFFERED .....

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HELP WANTED .....

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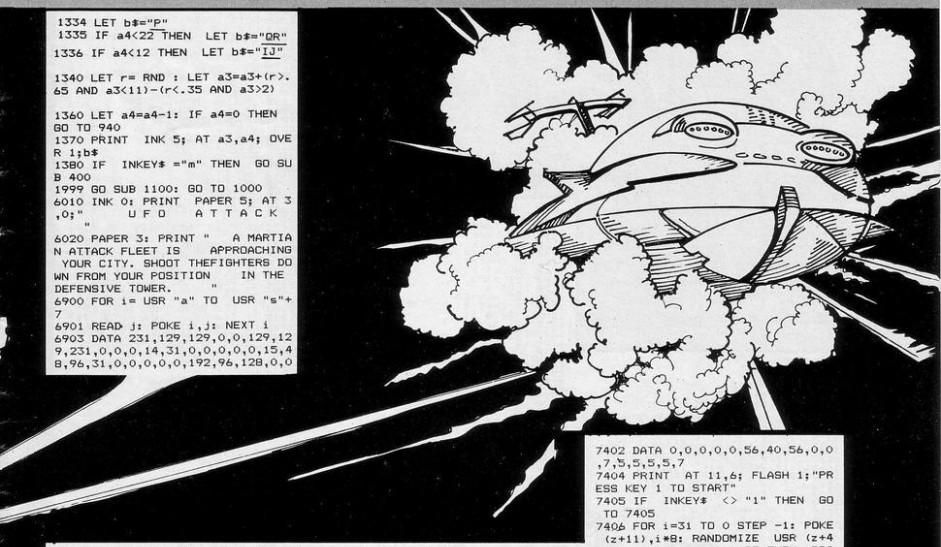
UFO ATTACK

A Martian attack fleet is approaching your city. Shoot the fighters down from your position in the defence tower. The controls for your cannon are 2, W, 9, 0 and M. The game features good graphics, sound effects and explosion routines. Damage to the city is shown on the screen as a percentage and the affected buildings are set alight.

UFO Attack was written for the 48K Spectrum by Anthony Sherwood of West Bromwich, West Midlands.

```
    5 LET z=59000: OVER 0: PAPER
 0: INK 7: BORDER 1: CLS
   8 RESTORE : GO TO 6000
  200 IF  RND >.5 THEN  LET q=a4:
  LET d=a3: POKE (z+36),90: GO TO
  202
  201 LET d=a1: LET q=a2
  208 LET e2=q*8+6: LET e1=(21-d)
 *8: OVER 1
  213 IF  ATTR (16,q)<128 THEN  P
 RINT  INK 6; PAPER 2; AT 16,q; F
 LASH 1;"H"
  220 INK 8: PLOT e2,e1: DRAW -3,
 (d-15)*8: FOR i=1 TO 6: RANDOMIZ
 E  USR (z+25): NEXT i: PLOT e2,e
 1: DRAW -3,(d-15)*8: INK 7
  225 IF  RND >.35 THEN  PRINT  A
 T 16,q;"H"
  230 OVER 0: LET x=x+5: POKE (z+
 36),60: RETURN
  400 LET ht=0: IF  ATTR (m1,m2)=
 6 THEN  LET ht=1
  405 IF  ATTR (m1,m2)=5 THEN  LE
 T ht=2
  410 OVER 1: LET g1=(21-m1)*8+4:
  LET g2=m2*8+4: PLOT 24,17: DRAW
  g2-24,g1-17: PLOT 231,17: DRAW
 g2-231,g1-17
  425 RANDOMIZE  USR (z+4): RANDO
 MIZE  USR (z+4): PLOT 24,17: DRA
 W g2-24,g1-17: PLOT 231,17: DRAW
  g2-231,g1-17
  450 OVER 0: IF ht>0 THEN  LET s
 =s+1: LET i=20- LEN  STR$ s: PRI
 NT  INK 0; PAPER 5; AT 19,i;s: G
 O TO 600
  499 RETURN
  601 OVER 1: IF ht=1 THEN  PRINT
   AT a1,a2;a$: GO TO 603
  602 PRINT  AT a3,a4;b$
  605 POKE (z+36),128
  610 BRIGHT 1: FOR i=1 TO 8: PRI
 NT  AT m1,m2-1;"RHR": RANDOMIZE
  USR (z+25): PRINT  AT m1,m2-1;"
 HRH": RANDOMIZE  USR (z+25)
  613 NEXT i: BRIGHT 0: POKE (z+3
 6),60
  620 LET t=1: LET y1=m2-1: LET y
 2=m1-1: LET y3=m2+1: LET y4=m1+1

  625 PRINT  AT m1,y1;"H"; AT y2,
 m2;"D"; AT m1,y3;"H"; AT y4,m2;"
 H"
  650 FOR i=1 TO 10: IF y1>0 THEN
   PRINT  AT m1,y1;"H": LET y1=y1
 -1: PRINT  AT m1,y1;"H"
  660 PRINT  AT y2,m2;"D": LET y2
 =y2-t: PRINT  AT y2,m2;"D"
  665 IF y2=3 THEN  LET t=-t
  670 IF y3<30 THEN  PRINT  AT m1
 ,y3;"H": LET y3=y3+1: PRINT  AT
 m1,y3;"H"
  680 IF y4<15 THEN  PRINT  AT y4
 ,m2;"H": LET y4=y4+1: PRINT  AT
 y4,m2;"H"
  690 NEXT i
  694 PRINT  AT m1,y1;"H"; AT y2,
 m2;"D"; AT m1,y3;"H"; AT y4,m2;"
 H"
  695 OVER 0
  700 IF ht=2 THEN  GO TO 926
  910 LET a2=0: LET a1=2+ INT ( R
 ND *10): LET a$="B"
  924 PRINT  OVER 1; AT a1,a2;a$

  925 GO TO 950
  940 LET a4=30: LET a3=2+ INT (
 RND *10): LET b$="P": PRINT  INK
  5; OVER 1; AT a3,a4;b$
  980 LET u=u+1: PRINT #0; INK 0;
  PAPER 5; AT 1,15;x;"%"; AT 1,27
 ;u
  983 IF x>79 THEN  FOR i=1 TO 42
 : PRINT  INK i/6; AT 4,2;"CITY I
 S IRREPARABLY DAMAGED"; AT 7,10;
 "MISSION OVER": RANDOMIZE  USR (
 z+25): NEXT i: GO TO 7302
 1030 PRINT  AT a1,a2; OVER 1;a$

 1034 LET a$="B"
 1035 IF a2>8 THEN  LET a$="CD"

 1036 IF a2>18 THEN  LET a$="EF"

 1040 LET r= RND : LET a1=a1+(r>.
 65 AND a1<11)-(r<.35 AND a1>2)

 1060 LET a2=a2+1: IF a2=30 THEN
  GO TO 904
 1070 PRINT  INK 6; AT a1,a2; OVE
 R 1;a$
 1075 IF  INKEY$ ="m" THEN  GO SU
 B 400
 1080 IF  RND <.13 THEN  GO SUB 2
 00
 1090 GO SUB 1110: GO TO 1181
 1110 LET m4=m2+( INKEY$ ="O" AND
  m2<30)-( INKEY$ ="9" AND m2>1)

 1130 LET m3=m1+( INKEY$ ="w" AND
  m1<11)-( INKEY$ ="2" AND m1>2)

 1165 PRINT  INK 8; OVER 1; AT m1
 ,m2;"A": LET m1=m3: LET m2=m4: P
 RINT  INK 8; OVER 1; AT m1,m2;"A
 ": RETURN
 1330 PRINT  AT a3,a4; OVER 1;b$
```



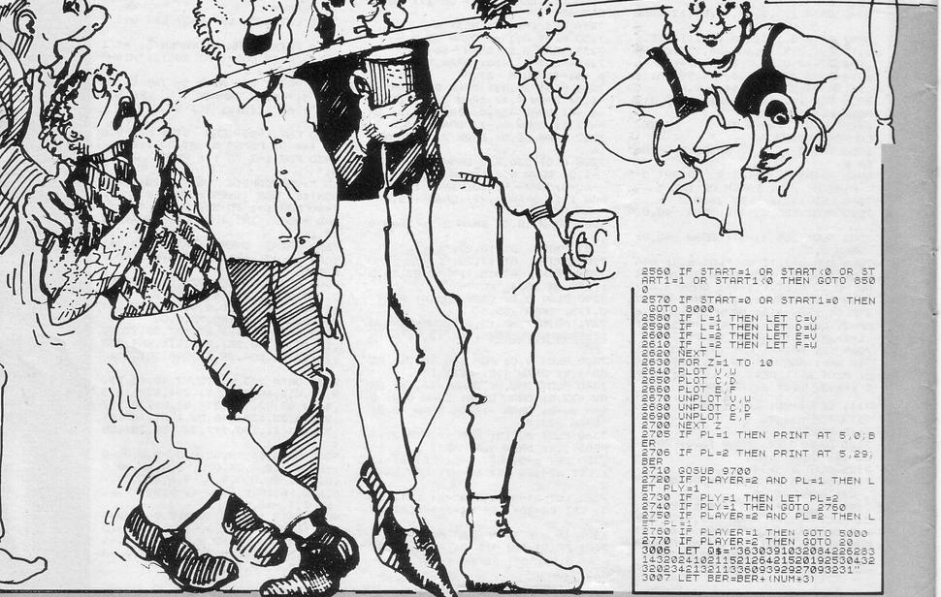
```
1334 LET b$="P"
1335 IF a4<22 THEN  LET b$="OR"
1336 IF a4<12 THEN  LET b$="IJ"

1340 LET r= RND : LET a3=a3+(r>.
65 AND a3<11)-(r<.35 AND a3>2)

1360 LET a4=a4-1: IF a4=0 THEN
GO TO 940
1370 PRINT  INK 5; AT a3,a4; OVE
R 1;b$
1380 IF  INKEY$ ="m" THEN  GO SU
B 400
1999 GO SUB 1100: GO TO 1000
6010 INK 0: PRINT  PAPER 5; AT 3
,0;"      U F O     A T T A C K
    "
6020 PAPER 3: PRINT "    A MARTIA
N ATTACK FLEET IS     APPROACHING
 YOUR CITY. SHOOT THEFIGHTERS DO
WN FROM YOUR POSITION     IN THE
DEFENSIVE TOWER.      "
6900 FOR i= USR "a" TO  USR "s"+
7
6901 READ j: POKE i,j: NEXT i
6903 DATA 231,129,129,0,0,129,12
9,231,0,0,0,14,31,0,0,0,0,0,15,4
8,96,31,0,0,0,0,0,0,192,96,128,0,0
,0,15,16,32,64,192,63,0,0,224,16
,8,4,6,248,0
6905 DATA 1,3,7,15,31,63,127,255

6907 DATA 5,133,220,127,116,68,7
6,12,0,1,3,7,15,60,224,128,0,128
,192,224,240,60,7,1
6908 DATA 18,60,126,191,92,16,16
,16,24,44,223,122,44,8,8,8
6920 FOR i=z TO (z+72): READ j:
POKE i,j: NEXT i
6945 PRINT  PAPER 5;"     LASER
CANNON CONTROLS      "
6950 PRINT "       RAISE 2   LOW
ER W      "
6960 PRINT "   LEFT 9   RIGHT 0
   FIRE M     ": PAPER 0: INK 7
7000 LET i=216: LET j=60
7002 PLOT 255,(j-3): DRAW -40,0

7003 PLOT 255,(j-5): DRAW -42,0:
 DRAW 2,2
7005 FOR p=1 TO 3: PLOT i,j: DRA
W 0,16: DRAW 8,0: DRAW 0,-16: DR
AW -8,0: PLOT i,j+16: DRAW 3,3:
DRAW 8,0: DRAW 0,-16: DRAW -3,-3
: PLOT i+8,j+16: DRAW 3,3: LET a
cr=3: LET up=7: GO SUB 7065: LET
 i=i+14: NEXT p: GO TO 7110
7065 LET k=i+2: LET l=j: FOR m=1
 TO acr: FOR n=1 TO up: LET l=l+
2: PLOT k,l: NEXT n: LET l=j: LE
T k=k+2: NEXT m: RETURN

7111 LET i=80: LET j=40
7112 FOR p=1 TO 4
7115 PLOT i,j
7120 DRAW 0,24: DRAW 16,0: DRAW
0,-24: DRAW -16,0
7125 PLOT i,j+24
7130 DRAW 5,5: DRAW 16,0: DRAW 0
,-24: DRAW -5,-5
7140 PLOT (i+16),(j+24): DRAW 5,
5: PLOT i,j+6: DRAW -10,-10: DRA
W 8,0: DRAW -2,-2: DRAW -11,0: D
RAW 14,14: PLOT i+11,j-4: DRAW 6
,0: DRAW 12,12: DRAW -7,0: DRAW
0,2: DRAW 12,0: DRAW -16,-16: DR
AW -10,0: DRAW 2,2
7200 LET acr=7: LET up=11: GO SU
B 7065
7210 LET i=i+37: NEXT p
7250 PLOT 0,j-6: DRAW 58,0
7255 DRAW 2,2: DRAW -60,0
7260 PLOT 0,j-10: DRAW 73,0: DRA
W -4,-4: DRAW -69,0
7261 PLOT 20,45: DRAW 0,6: DRAW
-1,0: DRAW 4,4: DRAW 36,0: DRAW
-4,-4: DRAW -36,0: DRAW 36,0: DR
AW 1,1: DRAW 0,-7: DRAW -36,0
7262 DRAW 36,0: DRAW 2,2: DRAW 0
,6
7263 PLOT 230,40: DRAW 0,6: DRAW
 -1,0: DRAW 4,4: DRAW 18,0: DRAW
 -4,-4: DRAW -18,0: DRAW 18,0: D
RAW 1,1: DRAW 0,-7: DRAW -18,0

7264 DRAW 18,0: DRAW 2,2: DRAW 0
,6
7287 PRINT  AT 18,27;"L K L"
7288 PRINT  AT 17,28;"L K"
7289 PRINT  AT 15,1;"L"; AT 16,0
;"L"; AT 16,4;"KL"
7290 PLOT 0,0: DRAW 255,0: PLOT
0,175: DRAW 255,0
7291 PRINT  AT 12,0;"SSNSMMSNNSS
SSSSSSNMSSSSSSSS"; AT 13,3;"M  M
.MM"
7300 PLOT 0,0: FOR i=1 TO 26: RE
AD j,k: DRAW j,k: NEXT i
7340 PLOT 255,0: DRAW -16,16: DR
AW -32,0: DRAW 0,-8: DRAW 0,8: D
RAW 8,-8: DRAW -16,0: DRAW -8,8:
 DRAW -23,0
7360 PLOT 0,175: FOR i=1 TO 27:
READ j,k: DRAW j,k: NEXT i
7380 LET s=0: LET h=0: LET m1=11
: LET m2=16: LET m3=m1: LET m4=m
2
7382 LET a1=8: LET a2=0: LET a3=
3: LET a4=30: LET b$="P": LET a$
="B"
7400 IF s>h THEN  LET h=s
7401 PRINT #0; INK 3; AT 0,2;"0"
; AT 0,29;"0"; PAPER 3; AT 0,3;"
                "
7402 DATA 0,0,0,0,0,56,40,56,0,0
,7,5,5,5,5,7
7404 PRINT  AT 11,6; FLASH 1;"PR
ESS KEY 1 TO START"
7405 IF  INKEY$  <> "1" THEN  GO
 TO 7405
7406 FOR i=31 TO 0 STEP -1: POKE
 (z+11),i*8: RANDOMIZE  USR (z+4
): IF  ATTR (16,i)>127 THEN  PRI
NT  AT 16,i; OVER 1;"H"
7407 NEXT i
7408 LET s=0: LET x=0: LET u=1

7410 PRINT  INK 0; PAPER 5; AT 1
9,12;"HITS 000"; AT 20,12;"HIGH
000"
7415 PRINT #0; AT 1,2; INK 0; PA
PER 5;" CITY DAMAGE      UFO NO.
   "; AT 1,15;x;"%"; AT 1,27;u

7420 LET i=20- LEN  STR$ h: PRIN
T  INK 0; PAPER 5; AT 20,i;h
7430 FOR i=2 TO 11: PRINT  AT i,
0;"
   ": RANDOMIZE  USR (z+25): RAN
DOMIZE  USR (z+25): NEXT i
7440 FOR i=1 TO 25: PLOT  INT (
RND *250), INT ( RND *67+88): NE
XT i
7680 PRINT  OVER 1; AT m1,m2;"A"
; AT a1,a2;a$; AT a3,a4;b$: GO T
O 950
9001 DATA 128,192,224,240,248,25
2,254,255,0,0,0,0,4,14,17,0,0,0,0,
6,15,31,112,64,0,0,0,0,0,0,128,224
,32,0,0,0,0,0,180,75,0,0
9004 DATA 11,167,67,237,58,72,92
,15,15,15,30,251,243,211,254,238
,16,67,16,254,28,32,246,251,201

9006 DATA 243,58,72,92,15,15,15,
8,38,0,1,60,0,8,211,254,238,16,8
,46,0,85,92,167,237,82,237,82,17
,254,0,25,125,148,56,1,61,103,61
,32,253,11,120,177,32,223,251,20
1
9050 DATA 16,16,32,0,0,-8,0,8,-8
,-8,16,0,8,8,24,0,0,-6,0,21,80,0
,0,-31,-80,0,0,9,0,-9,6,6,0,19,-
6,6,6,-6,68,0,6,6,-6,-6,0,-19,6,
-6,-6,6,-68,0
9055 DATA 15,-15,32,0,0,8,0,-8,-
8,8,16,0,8,-8,32,0,-15,15,15,-15
,0,15,9,0,8,-8,32,0,8,8,9,0,0,-1
5,15,15,-15,-15,32,0,8,8,16,0,-8
,-8,0,8,0,-8,32,0,14,14
```

DARTS

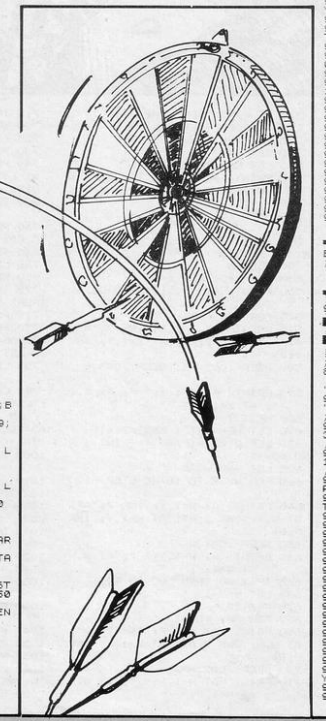
One or two people can play and may choose to have a 501 or a 301 start. The dartboard is shown and the cursor moves round the board. Press any key when you wish the cursor to stop. You will then be shown a bar with STDO. on it. Pressing any key as the cursor flashes over these characters will determine whether you score a single, double, treble, 25 or bull-seye.

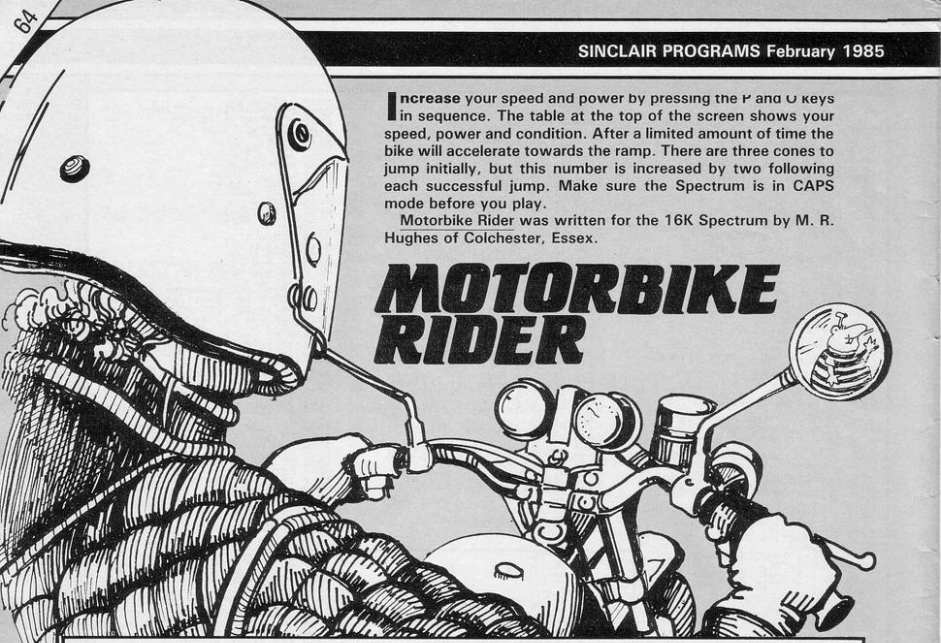
Darts is an excellent program written for the 16K ZX-81 by Gary Braunton of Redruth, Cornwall.

```
  10 GOSUB 9000
  20 GOTO 9500
  30 GOTO 1000
  40 GOSUB 1500
1000 FOR L=1 TO 3
1005 IF PL=1 THEN PRINT AT 0,0;"
PLAY
1010 IF PL=2 THEN PRINT AT 0,29;
"PLAY
1020 LET A$="413331845280442424134
7200564715104510154105010605284173320
4027041922250711010161615001161911
1168411419290982833180"
1030 FOR I=1 TO 100: STER 5
1040 LET X=VAL A$(I TO I+1)
1050 LET Y=VAL A$(I+2 TO I+3)
1060 PLOT X,Y
1065 LET NUM=VAL A$(I+4 TO I+5)
1070 IF INKEY$<>"" THEN GOTO 40
1080 UNPLOT X,Y
1090 NEXT I
1100 LET X=26
1110 LET Y=36
1120 PLOT X,Y
1130 LET NUM=5
1140 IF INKEY$<>"" THEN GOTO 40
1150 UNPLOT X,Y
1160 LET X=32
1170 PLOT X,Y
1180 LET NUM=20
1190 IF INKEY$<>"" THEN GOTO 40
1200 UNPLOT X,Y
1210 LET X=Y
1220 PLOT X,Y
1230 LET NUM=1
1240 IF INKEY$<>"" THEN GOTO 40
1250 UNPLOT X,Y
1260 GOTO 1020
1270 IF INKEY$<>"" THEN GOTO 150
0
1510 DIM T$(5,5)
1520 LET T$(1)="BULL"
1530 LET T$(2)="SNGL"
1540 LET T$(3)="SDBL"
1550 LET T$(4)="STRE"
1560 LET T$(5)="SDTO"
1570 FOR T=1 TO 5
1580 PRINT AT 23,25;T$(T)
1590 IF INKEY$<>"" THEN GOTO 200
0
1600 IF L=4 THEN RETURN
1610 NEXT T
1620 GOTO 1570
2005 GOTO 1500+(T+500)
2007 LET BER=BER+NUM
2008 IF PL=1 THEN LET START=STAR
T-NUM
2009 IF PL=2 THEN LET START1=STA
RT1-NUM
2010 IF START<=1 OR START1<=1 TH
EN GOTO 8500
2040 IF L=1 THEN LET C=X
2050 IF L=1 THEN LET D=Y
2060 IF L=2 THEN LET E=X
2070 IF L=2 THEN LET F=Y
2080 NEXT L
2100 FOR Z=1 TO 10
2110 PLOT X,Y
2120 PLOT C,D
2130 PLOT E,F
2140 UNPLOT X,Y
2150 UNPLOT C,D
2160 UNPLOT E,F
2170 NEXT Z
2175 IF PL=1 THEN PRINT AT 5,0;B
ER
2176 IF PL=2 THEN PRINT AT 5,29;
BER
2180 GOSUB 9700
2200 IF PLAYER=2 AND PL=1 THEN L
ET PLY=1
2220 IF PLY=1 THEN LET PL=2
2230 IF PLY=1 THEN GOTO 2300
2240 IF PLAYER=2 AND PL=2 THEN L
ET PL=1
2300 IF PLAYER=2 THEN GOTO 20
2310 IF PLAYER=1 THEN GOTO 5000
2500 LET Z$="3939430230044802253
9582202202121314331511411190037512
0122844807507380043728002240"
2507 LET BER=BER+(NUM*2)
2508 IF PL=1 THEN LET START=STAR
T-(NUM*2)
2509 IF PL=2 THEN LET START1=STA
RT1-(NUM*2)
2510 LET M=NUM-3
2515 UNPLOT X,Y
2520 LET NUM=(NUM+3)+M
2530 LET U=VAL Z$(NUM TO NUM+1)
2540 LET W=VAL Z$(NUM+2 TO NUM+3

2550 PLOT U,W
2553 IF NUM=9 THEN UNPLOT U,W
2555 LET NUM=NUM-M
2556 LET NUM=NUM/2
2550 IF START=1 OR START<0 OR ST
ART1=1 OR START1<0 THEN GOTO 850
0
2570 IF START=0 OR START1=0 THEN
 GOTO 8000
2580 IF L=1 THEN LET C=U
2590 IF L=1 THEN LET D=W
2600 IF L=2 THEN LET E=U
2610 IF L=2 THEN LET F=W
2620 NEXT L
2630 FOR Z=1 TO 10
2640 PLOT U,W
2650 PLOT C,D
2660 PLOT E,F
2670 UNPLOT U,W
2680 UNPLOT C,D
2690 UNPLOT E,F
2700 NEXT Z
2705 IF PL=1 THEN PRINT AT 5,0;B
ER
2706 IF PL=2 THEN PRINT AT 5,29;
BER
2720 GOSUB 9700
2730 IF PLAYER=2 AND PL=1 THEN L
ET PLY=1
2730 IF PLY=1 THEN LET PL=2
2740 IF PLY=1 THEN GOTO 2760
2750 IF PLAYER=2 AND PL=2 THEN L
ET PL=1
2760 IF PLAYER=1 THEN GOTO 5000
2770 IF PLAYER=2 THEN GOTO 20
3005 LET Q$="9830391032084226283
1430824102115212642152019253043
9202342132113360939292709323"
3007 LET BER=BER+(NUM+3)
```



```
3008 IF PL=1 THEN LET START=STAR
T-(NUM+3)
3009 IF PL=2 THEN LET START1=STA
RT1-(NUM+3)
3010 LET M=NUM-3
3015 UNPLOT X,Y
3020 LET NUM=(NUM+3)+M
3030 LET R=VAL 0$(NUM TO NUM+1)
3040 LET S=VAL 0$(NUM+2 TO NUM+3
)

3050 PLOT R,S
3060 LET NUM=NUM-M
3070 LET NUM=NUM/3
3080 IF START<=1 OR START<=1 THE
N GOTO 8500
3110 IF L=1 THEN LET C=R
3120 IF L=1 THEN LET D=S
3130 IF L=2 THEN LET E=R
3140 IF L=2 THEN LET F=S
3150 NEXT L
3160 FOR Z=1 TO 10
3170 PLOT C,D
3180 PLOT E,F
3190 PLOT R,S
3200 UNPLOT C,D
3210 UNPLOT E,F
3220 UNPLOT R,S
3230 NEXT Z
3235 IF PL=1 THEN PRINT AT 5,0;B
ER
3236 IF PL=2 THEN PRINT AT 5,29;
BER
3240 GOSUB 9700
3250 IF PLAYER=2 AND PL=1 THEN L
ET PLY=2
3260 IF PLY=1 THEN LET PL=2
3270 IF PLY=1 THEN GOTO 3290
3280 IF PLAYER=2 AND PL=2 THEN L
ET PL=1
3290 IF PLAYER=1 THEN GOTO 5000
3300 IF PLAYER=2 THEN GOTO 20
3505 PLOT 32,18
3507 LET BER=BER+25
3510 IF PL=1 THEN LET START=STAR
T-25
3520 IF PL=2 THEN LET START1=STA
RT1-25
3525 UNPLOT X,Y
3530 IF START<=1 OR START1<=1 TH
EN GOTO 8500
3540 IF L=1 THEN LET C=32
3550 IF L=1 THEN LET D=18
3560 IF L=2 THEN LET E=32
3570 IF L=2 THEN LET F=18
3580 NEXT L
3590 FOR Z=1 TO 10
3600 PLOT 32,18
3610 PLOT C,D
3620 PLOT E,F

4140 UNPLOT 32,20
4150 UNPLOT C,D
4160 UNPLOT E,F
4170 NEXT Z
4175 IF PL=1 THEN PRINT AT 5,0;B
ER
4176 IF PL=2 THEN PRINT AT 5,29;
BER
4180 GOSUB 9700
4190 IF PLAYER=2 AND PL=1 THEN L
ET PLY=1
4200 IF PLY=1 THEN LET PL=2
4210 IF PLY=1 THEN GOTO 4230
4220 IF PLAYER=2 AND PL=2 THEN L
ET PL=1
4230 IF PLAYER=1 THEN GOTO 5000
4240 IF PLAYER=2 THEN GOTO 20
5006 IF START1=101 THEN GOTO 600
0
5007 LET N$="32363236323136630270
93240328183218322032363218273632
6413223033"
5008 LET PLA=0
5009 IF GO=1 THEN FOR I=1 TO 7
5010 IF GO=1 THEN PLOT 32,40
5011 IF GO=1 THEN UNPLOT 32,40
5012 IF GO=1 THEN PLOT 32,20
5013 IF GO=1 THEN UNPLOT 32,20
5014 IF GO=1 THEN PLOT 32,31
5015 IF GO=1 THEN UNPLOT 32,31
5016 IF GO=1 THEN NEXT I
5017 IF GO=1 THEN LET NUM=150
5018 IF GO=1 THEN GOTO 5093
5019 LET U=INT (RND*5)
5020 IF START1=151 THEN LET U=3
5025 LET V=(U+12)+1
5030 FOR F=K TO K+9 STEP 4
5035 FOR I=1 TO 7
5040 LET XY=VAL N$(F TO F+1)
5050 LET YZ=VAL N$(F+2 TO F+3)
5060 UNPLOT XY,YZ
5062 PLOT XY,YZ
5065 NEXT I
5070 NEXT F
5080 IF U=0 OR U=1 OR U=2 THEN L
ET NUM=100
5090 IF U=3 OR U=4 THEN LET NUM=
50

5093 LET GO=0
5095 LET START1=START1-NUM
5096 PRINT AT 5,29;NUM
5100 FOR F=1 TO 40
5110 NEXT F
5120 GOTO 20
5800 FOR U=1 TO 20
5805 PLOT 36,89
6008 UNPLOT 32,20
6010 UNPLOT 36,89
6015 PLOT 32,20
6018 NEXT U
6020 PRINT AT 3,29;" 0 ";AT 5,28
;"GAME";AT 7,27;"PLAY";TAB 26;"
AGAIN?"
6030 FOR U=1 TO 40
6040 NEXT U
6050 GOTO 8040
8000 IF PL=1 THEN PRINT AT 3,0;"
 0 ";AT 5,0;"GAME";AT 21,0;"PLAY
";TAB 0;"AGAIN?"
8010 IF PL=2 THEN PRINT AT 3,28;
" 0 ";AT 5,28;"GAME";AT 19,28;"P
LAY";AT 20,26;"AGAIN?"
8020 FOR U=1 TO 30
8030 NEXT U
8040 POKE 16418,2
8050 IF INKEY$="Y" THEN RUN
8060 IF INKEY$="N" THEN STOP
8070 GOTO 8050
8500 IF PL=1 THEN PRINT AT 3,0;"
BUST"
8510 IF PL=2 THEN PRINT AT 3,28;
"BUST"
8520 IF PL=1 THEN LET START=STAR
T+BER
8530 IF PL=2 THEN LET START1=STA
RT1+BER
8535 FOR U=1 TO 30
8536 NEXT U
8538 IF PLAYER=1 THEN GOTO 5000
8540 LET BER=0
8660 IF PL=2 THEN GOTO 8670
8665 LET PL=2
8666 GOTO 20
8670 LET PL=1
8680 GOTO 20
8999 STOP
9000 CLS
9005 PRINT AT 9,1;" HOW MANY PLA
YERS (1 OR 2) ?"
9010 INPUT PLAYER
9015 IF PLAYER<>1 AND PLAYER<>2
THEN GOTO 9000
9020 PRINT
9030 PRINT "  A 501 START OR A 3
01 START ?"
9040 INPUT START
9050 IF START<>301 AND START<>50
1 THEN GOTO 9040
9060 LET START1=START
9070 LET C=0
9080 LET D=0
9090 LET E=0
9100 LET F=0
9110 LET PL=1
9115 LET GO=1
9120 LET BER=0
9125 LET PLA=PLAYER
9130 RETURN
9500 CLS
9505 POKE 16418,0
9510 PRINT AT 0,15;"20"
9520 PRINT TAB 12;"  ";TAB 9;"  ";TAB
 10;"  ";TAB 7;"  ";TAB 6;"  ";TAB
 5;"  ";TAB 4;"  ";TAB 3;"  ";TAB
 2;"  ";TAB 1;"  ";TAB 0;"  ";TA
B 0;"  ";TAB 1;"  ";TAB 2;"  ";TAB 3
;"  ";TAB 4;"  ";TAB 5;"  ";TAB 6;"
  ";TAB 7;"  ";TAB 8;"  ";TAB 9;"
  ";TAB 10;"  ";TAB 11;"  ";TAB 12
;"  "
9530 PRINT TAB 5;"  ";TAB 5;"  ";
TAB 5;"  ";TAB 5;"  ";TAB 6;"  ";TAB
 6;"  ";TAB 7;"  ";TAB 7;"  ";TAB
 8;"  ";TAB 8;"  ";TAB 9;"  ";TAB
 10;"  ";TAB 11;"  ";TAB 12;"  "
9540 PRINT AT 0,12;"5";TAB 18;"1
";AT 2,8;"12";TAB 22;"18";AT 5,6
;"9";TAB 23;"4"
9550 PRINT AT 8,3;"14";TAB 27;"1
3";AT 11,3;"11";TAB 27;"6";AT 15
,4;"8";TAB 27;"10"
9560 PRINT AT 18,5;"16";TAB 25;"
15";AT 21,9;"7";TAB 22;"2";AT 23
,11;"19  3  17"
9570 PRINT AT 0,0;"PL1";TAB 29;"
PL2";TAB 0;"  ";TAB 29;"  "
9580 PRINT AT 3,0;START;TAB 29;S
TART1
9590 LET PLY=0
9600 LET BER=0
9610 IF PL=1 THEN GOTO 5000
9620 GOTO 30
9700 LET X=0
9710 LET Y=0
9720 LET C=0
9730 LET D=0
9740 LET E=0
9750 LET F=0
9760 LET U=0
9770 LET V=0
9780 LET R=0
9790 LET S=0
9795 RETURN
9990 CLEAR
9995 SAVE "DARTS"
9997 PRINT AT 11,2;"PRESS ANY KE
Y TO PLAY DARTS"
9998 IF INKEY$="" THEN GOTO 9998
9999 RUN
```





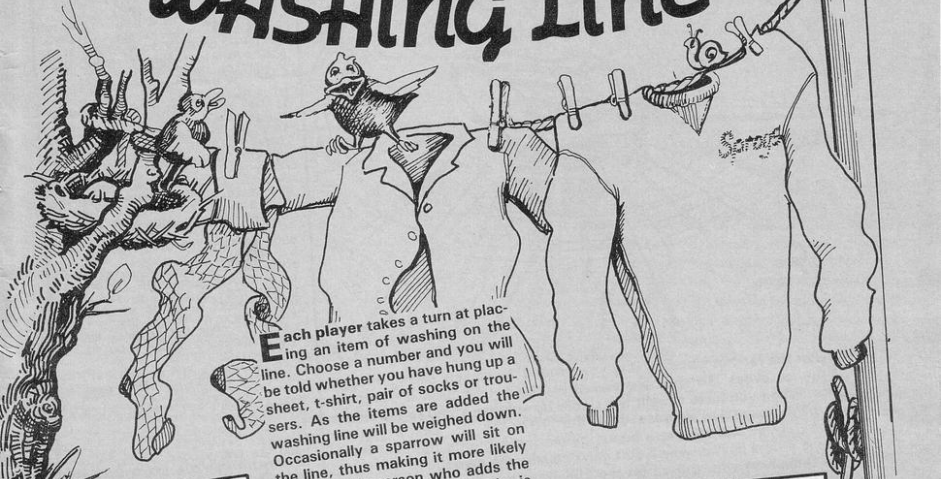
Increase your speed and power by pressing the P and O keys in sequence. The table at the top of the screen shows your speed, power and condition. After a limited amount of time the bike will accelerate towards the ramp. There are three cones to jump initially, but this number is increased by two following each successful jump. Make sure the Spectrum is in CAPS mode before you play.

Motorbike Rider was written for the 16K Spectrum by M. R. Hughes of Colchester, Essex.

MOTORBIKE RIDER

```
  5 GO SUB 1000
  10 BORDER 4: PAPER 4: INK 0: B
RIGHT 1: CLS
  20 BEEP .1,20
  30 PRINT  AT 10,5;"PRESS A KEY
 TO START"
  40 PAUSE 0
  45 CLS
  50 LET X=18: LET Y=0
  60 LET SP=0
  65 LET POINTS=0
  70 LET A$="BC": LET B$="ED"
  80 LET P=0: LET H=2
  90 LET CO=5: LET AC=0: LET M=0
  95 LET C$="F GGGGGGGGGGGGGGGG
GGGGGGGG"
  100 BEEP .2,15
  110 FOR T=0 TO 5: PRINT  INK 5;
 INVERSE 1;"
          ": NEXT T
  120 PRINT  AT 0,1; INK 7; PAPER
 0;"SPEED ";SP
  125 PRINT  AT 21,10; PAPER 0; I
NK 6;"POINTS "; INT POINTS
  130 PRINT  AT 1,1; INK 7; PAPER
 0;"POWER ";P
  140 PRINT  AT 3,0;"CONDITION":
PRINT  AT 3,10; INK H;"(ig8)"
  150 PRINT  AT X-1,Y; INK 7;"A";
 AT X,Y; INK 2;A$; AT X+1,Y; INK
 0;B$
  160 IF AC=0 THEN  PRINT  AT 12,
12;"START": FOR J=1 TO 70: BEEP
 .005,-5: BEEP .005,-10: NEXT J:
 PRINT  AT 12,12;"      "
  170 LET I$= INKEY$
  175 LET AC=1
  180 IF I$="P" AND P<100 THEN  G
O SUB 200
  190 LET M=M+1
  192 IF M>100 THEN  GO TO 500
  195 GO TO 120
  200 IF  INKEY$ ="O" THEN  GO TO
 205
  202 GO TO 200
  205 LET P=P+1
  210 LET SP=SP+2
  215 IF P>25 THEN  LET H=6
  220 IF P>50 THEN  LET H=3
  230 IF P>75 THEN  LET H=7
  240 RETURN
  510 FOR N=0 TO 30
  515 PRINT  AT X-1,N; INK 7;"A";
 AT X,N; INK 2;A$; AT X+1,N; INK
 0;B$
  520 BEEP .005,-10: BEEP .002,-1
5
  530 PRINT  AT X-1,N;"  "; AT X,
N;"  "; AT X+1,N;"  "
  540 NEXT N
  550 LET Y=0: LET X=18
  560 PRINT  AT 19,5;C$( TO CO)

  570 FOR I=0 TO 3
  575 PRINT  AT X-1,I; INK 7;"A";
 AT X,I; INK 2;A$; AT X+1,I; INK
 0;B$
  580 BEEP .002,-5: BEEP .003,0

  590 PRINT  AT X-1,I;" "; AT X,I
;"  "; AT X+1,I;"  "
  600 NEXT I
  610 LET HE= INT ( RND *2)+1
  620 LET DI=HE+(P/3- 4)- INT ( R
ND *5+(1))
  625 LET Y=3
  630 FOR W=18 TO 18-HE STEP -1

  640 PRINT  AT W-1,Y; INK 7;"A";
 AT W,Y; INK 2;A$; AT W+1,Y; INK
 0;B$
  650 BEEP .001,2
  660 PRINT  AT W-1,Y;" "; AT W,Y
;"  "; AT W+1,Y;"  "
  665 IF Y>30 THEN  GO TO 900
  667 LET Y=Y+1
  670 NEXT W
  680 FOR P=Y TO DI
  690 PRINT  AT W-1,P; INK 7;"A";
 AT W,P; INK 2;A$; AT W+1,P; INK
 0;B$
  700 BEEP .002,-4
  710 PRINT  AT W-1,P;" "; AT W,P
;"  "; AT W+1,P;"  "
  715 IF P>30 THEN  GO TO 730
  720 NEXT P
  725 LET Y=P
  730 FOR L=W TO 18
  740 PRINT  AT L-1,Y; INK 7;"A";
 AT L,Y; INK 2;A$; AT L+1,Y; INK
 0;B$
  750 BEEP .002,0: BEEP .001,-10

  760 PRINT  AT L-1,Y;" "; AT L,Y
;" "; AT L+1,Y;"  "
  765 IF Y>30 THEN  GO TO 900
  766 LET Y=Y+1
  770 NEXT L
  775 IF  SCREEN$ (L,Y+1) <> " "
THEN  GO TO 900
  779 PAUSE 20
  780 PRINT  AT 10,2;"WELL DONE!
TRY AGAIN ": PAUSE 0: LET CO=CO+
2: LET AC=1
  785 LET POINTS=POINTS+SP+CO/2

  790 LET SP=0: LET P=0: LET X=18
: LET Y=0: LET H=2: LET M=0: CLS
 : GO TO 110
AD LUCK! GAME OVER": PAUSE 0: GO
 TO 10
1000 DATA 0,0,0,56,125,96,96,60

1010 DATA 56,126,127,125,125,62,
122,255
1011 DATA 0,0,208,48,16,208,176,
252
1015 DATA 243,180,91,169,165,37,
19,12
1020 DATA 255,56,121,222,238,204
,248,48
1030 DATA 0,0,6,14,30,62,126,254

1040 DATA 0,0,0,0,24,24,60,126

1045 FOR C=144 TO 150
1050 FOR M=0 TO 7
1055 READ A
1060 POKE  USR  CHR$ C+M,A: NEXT
 M: NEXT C
2000 RETURN
```

WASHING LINE



Each player takes a turn at placing an item of washing on the line. Choose a number and you will be told whether you have hung up a sheet, t-shirt, pair of socks or trousers. As the items are added the washing line will be weighed down. Occasionally a sparrow will sit on the line, thus making it more likely to snap. The person who adds the last item before the line breaks is the loser.

Washing Line was written for the 16K ZX-81 by Simon Williams of Bradford, W. Yorks.

```
1 REM WASHING LINE
5 GOSUB 1500
6 FAST
10 CLS
20 FOR F=6 TO 20
25 PRINT AT F,0;"▌";AT F,31;"▌
";
30 NEXT F
40 PRINT AT 6,1;"
";
50 PRINT AT 21,0;"
";
60 PRINT AT 19,2;"
";PRINT AT 20,2;"
";
65 LET P=1
90 LET ST=0
95 LET RST=INT (RND*25)+25
96 SLOW
100 PRINT AT 16,2;"PLAYER ";P;A
T 17,2;"CHOOSE NOW."
105 INPUT U
106 IF U<1 OR U>4 THEN PRINT AT
17,2;"DAFT. DON'T BE";AT 17,2;"
";PAUSE 10
107 IF U>4 OR U<1 THEN GOTO 100
109 LET E=INT (RND*5)+1
110 IF E=1 THEN LET EE=1
115 IF E=2 THEN LET EE=7
120 IF E=3 THEN LET EE=13
125 IF E=4 THEN LET EE=25
130 IF E=5 THEN LET EE=31
135 LET O=INT (RND*4)+1
140 LET O$=INT (RND*4)+1
150 IF O=O$ THEN GOTO 145
151 IF O=0000 THEN GOTO 150
152 IF O$=0000 THEN GOTO 151
153 LET O=0000
154 LET O$=0000
155 IF O=O$ THEN GOTO 151
160 IF O=0000 THEN GOTO 151
170 IF U=1 THEN GOSUB 1000
175 IF U=2 THEN GOSUB 1100
180 IF U=3 THEN GOSUB 1200
185 IF U=4 THEN GOSUB 1300
190 LET I=I+4.THEN GOSUB 1400
195 IF I>14 THEN LET P=1
196 LET P=P+1
197 IF P>2 THEN LET P=1
199 GOTO 100
1000 FOR A=7 TO 11
1005 PRINT AT A,EE;A$(A-6)
1010 NEXT A
1020 IF ST=ST+1
1025 IF ST>RST THEN GOTO 2000
1030 PRINT AT 15,20;"";AT 17,20;"
";AT 16,20;"
";
1035 PRINT AT 18,20;"
";
1040 RETURN
1100 FOR A=7 TO 11
1105 PRINT AT A,EE;B$(A-6)
1110 NEXT A
1115 LET ST=ST+2
1120 IF ST>RST THEN GOTO 2000
1130 PRINT AT 15,20;"";AT 17,20;"
";AT 16,20;"
";
1135 PRINT AT 18,20;"
";
1140 RETURN
1200 FOR A=7 TO 11
1205 PRINT A
1210 LET ST=ST+3
1220 IF ST>RST THEN GOTO 2000
1230 PRINT AT 15,20;"";AT 17,20;"
";AT 16,20;"
";
1235 PRINT AT 18,20;"
";
1240 RETURN
1300 FOR A=7 TO 11
1305 PRINT A
1310 NEXT A
1315 LET ST=ST+4
1320 IF ST>RST THEN GOTO 2000
1330 PRINT AT 15,20;"";AT 17,20;"
";AT 16,20;"
";
1335 PRINT AT 18,20;"
";
1340 RETURN
1400 FOR L=0 TO EE
1410 PRINT AT 0,L;"▌";AT 1,L;"▌"
1420 PRINT AT 2,L;"▌";AT 3,L;"▌"
1430 NEXT L:PRINT AT 0,L;"▌";AT 4,EE+1;"▌
";AT 5,EE+1;"▌"
1440 LET ST=ST+3
1450 RETURN
1500 PRINT AT 2,0;"WASHING LINE"
1510 PRINT AT 4,0;" THE OBJECT O
F THIS GAME IS TO PLACE AS MAN
Y ITEMS OF CLOTHING ON THE WASH
ING LINE AS POSSIBLE, WITHOUT
SNAPPING IT. EACH ITEM OF CLOTH
ING ADDS TO THE POSSIBILITY OF
THE LINE SNAPPING, A BIRD WILL
OCCASIONALLY FLY OVER AND LAND ON THE LINE. IF IT DOES IT ALS
O ADDS TO THE WEIGHT. THE COMPU
TER WILL CHOOSE A NUMBER BETWEEN
1 AND 4. IT WILL THEN TELL YOU
WHAT YOU HAVE CHOSEN."
1545 PRINT "                PRESS ANY KEY
"
1546 PRINT "
";
1547 IF INKEY$="" THEN GOTO 1547
1550 FOR F=1 TO 22 STEP 2
1560 SCROLL
1580 SCROLL
1583 NEXT F
1584 PRINT AT 3,0;" THE LARGER I
TEMS OF CLOTHING (E.G. SHEETS)
ARE HEAVIER THAN THE SMALLER
ONES (E.G. SOCKS). SO IT IS BET
TER TO HAVE CHOSEN."
1585 PRINT "THE SMALLER OBJECTS.
"
1590 PRINT "THE LOSER IS THE PER
SON WHO HAS THE LAST TO PLACE AN
ITEM ON THE LINE"
1595 PRINT AT 15,0;"HOW MANY ARE
PLAYING"
1600 INPUT PL
1610 FAST
1620 DIM A$(5,6)
1625 DIM B$(5,6)
1630 DIM C$(5,6)
1635 DIM D$(5,6)
1640 LET A$(1)="
1645 LET A$(2)="
1650 LET A$(3)="
1655 LET A$(4)="
1660 REM
1665 LET B$(1)="
1670 LET B$(2)="
1675 LET B$(3)="
1680 LET B$(4)="
1685 LET B$(5)="
1690 LET C$(1)="
1695 LET C$(2)="
1700 LET C$(3)="
1705 LET C$(4)="
1710 LET C$(5)="
1715 LET D$(1)="
1720 LET D$(2)="
1725 LET D$(3)="
1730 LET D$(4)="
1735 LET D$(5)="
1740 RETURN
1800 RETURN
2000 FOR F=1 TO 6
2005 PRINT AT F,0;"
";
2010 NEXT F
2020 FOR F=4 TO 20
2030 PRINT AT F,0;"▌
";
2040 PRINT
2050 NEXT F
2060 FOR F=1 TO 10
2065 PRINT AT 9,9;"PLAYER ";P;" LOST"
2066 PRINT AT 9,9;"PLAYER ";P;" WON"
2067 IF F=10 THEN NEXT F
2068 FOR F=1 TO 22 STEP 2
2070 SCROLL
2075 SCROLL
2080 SCROLL
2085 NEXT F
2100 PRINT AT 9,0;"ANOTHER GAME
?"
2110 INPUT Z$
2120 IF Z$(1)="Y" THEN RUN
2130 IF Z$(1)<>"N" THEN GOTO 211
0
2140 PRINT "OK.THEN."
2150 STOP
9900 SAVE "WASHING LINE"
9910 PRINT "LOAD CHECK PASSED"
9920 PRINT AT 7,8;"WASHING LINE"
9930 FOR F=1 TO 60
9940 IF INKEY$<>"" THEN NEXT F
9950 PRINT AT 0,0;"
";
9960 RUN
```

Splat the red hot sword as it whizzes round the screen, slicing through the ice cubes. To splat the sword you have to squash it using the right of the cube and depress either the "I" or the "P" key. If you are successful you will receive a bonus before moving onto the next level. There is a time limit in which you must squash the sword.

Ice Cube Ivan was written for the 16K Spectrum by John Lonsdale of West Ferry, Dundee.

ICE CUBE IVAN

```
 10 PAPER 0: INK 7: BORDER 0: C
LS : POKE 23658,8: GO SUB 8000

 15 CLS : GO SUB 500
 20 GO SUB 550
 21 LET TI=450: FOR N=1 TO LE:
LET TI=TI-50: NEXT N
 25 PRINT AT 21,0;"SCORE:";S;"
   LEVEL:";LE;" LIVES:";L
 30 LET X=11: LET Y=16
 35 LET T=10: LET E=30: LET C=0

 45 PRINT AT T,E; INK 7;" "
 50 LET T=T+(T<K)-(T>K): LET E=
E+(E<J)-(E>J): IF INT T=K AND
INT E=J THEN LET K= INT ( RND *
18)+1: LET J= INT ( RND *28)+1

 55 PRINT AT T,E; INK 2;"I"
 70 IF X=T AND Y=E THEN GO TO
1000
 100 IF INKEY$ ="O" AND ATTR (
X-1,Y)=7 THEN PRINT AT X,Y;" "
: LET X=X-1
 110 IF INKEY$ ="Z" AND ATTR (
X+1,Y)=7 THEN PRINT AT X,Y;" "
: LET X=X+1
 120 IF INKEY$ ="P" AND ATTR (
X,Y+1)=5 THEN GO SUB 200
 130 IF INKEY$ ="I" AND ATTR (
X,Y-1)=5 THEN GO SUB 300
 140 IF INKEY$ ="I" AND ATTR (
X,Y-1) <> 5 THEN PRINT AT X,Y;
" ": LET Y=Y-1
 145 IF INKEY$ ="P" AND ATTR (
X,Y+1) <> 5 THEN PRINT AT X,Y;
" ": LET Y=Y+1
 150 PRINT AT X,Y;M$(W)
 155 LET W=W+1: IF W=3 THEN LET
W=1
 170 LET TI=TI-1: IF TI <= 0 THE
N GO TO 1000

 190 GO TO 40
 200 IF ATTR (X,Y+2) <> 7 THEN
RETURN
 202 LET c$=" ABCDEFGH ": LET d
=1: FOR n=Y+1 TO 30: FOR f=1 TO
4
 205 PRINT AT X,Y;"J"
 210 LET d=d+2: IF d>8 THEN LET
d=1
 215 IF ATTR (X,N+2)=2 THEN LE
T C=1
 220 PRINT AT X,n-1; INK 7;" ";
INK 5;c$(d);c$(d+1)
 230 NEXT f: IF ATTR (X,n+2)=7
OR ATTR (X,N+2)=2 THEN NEXT n

 235 PRINT AT X,N+1; INK 5;"A";
AT X,N; INK 7;" "
 237 IF C=1 THEN LET C=0: LET L
E=LE+1: LET S=S+450: GO TO 5000

 240 RETURN
 300 IF ATTR (X,Y-2) <> 7 THEN
RETURN
 302 LET c$=" HGFEDCBA": LET d=
1: FOR n=Y-1 TO 1 STEP -1: FOR f
=4 TO 1 STEP -1
 305 PRINT AT X,Y;"J"
 310 LET d=d+2: IF d>8 THEN LET
d=1
 315 IF ATTR (X,N-2)=2 THEN LE
T C=1
 320 PRINT AT X,n; INK 5;c$(d+1
);c$(d); INK 7;" "
 330 NEXT f: IF ATTR (X,n-1)=7
OR ATTR (X,N-1)=2 THEN NEXT n
 335 PRINT AT X,N; INK 5;"A"; A
T X,N+1; INK 7;" "
 337 IF C=1 THEN LET C=0: LET L
E=LE+1: LET S=S+450: GO TO 5000
 340 RETURN
 500 INK 5: FOR F=0 TO 31: PRINT
 AT 0,F;"(igB)": BEEP .01,F: NE
XT F: FOR F=1 TO 19: PRINT AT F
,31;"(igB)": BEEP .01,F: NEXT F

 510 FOR F=30 TO 0 STEP -1: PRIN
T AT 19,F;"(igB)": BEEP .01,F:
NEXT F: FOR F=19 TO 1 STEP -1: P
RINT AT F,0;"(igB)": BEEP .01,F
: NEXT F: INK 7: RETURN
 550 FOR N=1 TO 50: PRINT AT I
NT ( RND *18)+1, INT ( RND *28)+
1; INK 5;"A": BEEP .01,N/2: NEXT
N: RETURN
 1000 FOR F=1 TO 10: FOR N=4 TO 1
 STEP -1: BEEP .1,N: PRINT AT X
,Y; INK RND *7;"J": NEXT N: NEX
T F
 1010 LET L=L-1: IF L=0 THEN PRI
NT AT 10,11;"GAME OVER": FOR N=
1 TO 500: NEXT N: RUN
 1020 FOR N=1 TO 300: NEXT N: GO
TO 15
 5000 IF TI-200<1 THEN GO TO 502
0
 5010 FOR N=1 TO (TI-200)/5: PRIN
T AT 21,0;"SCORE:";S: LET S=S+1
: BEEP .009,35: NEXT N: FOR N=1
TO 200: NEXT N: GO TO 15
 5020 PRINT AT 10,11; FLASH 1;"N
O BONUS!": FOR N=1 TO 200: BEEP
.005,N/6: NEXT N: CLS : GO TO 15

 8000 RESTORE : FOR n= USR "a" TO
  USR "k"+7: READ a: POKE n,a: N
EXT n
 8020 LET S=0: LET M$="JK": LET W
=1
 8030 LET LE=1: LET L=3
 8040 LET J=13: LET K=13
 8400 RESTORE 9100
 8500 PRINT AT 5,10;"ICE CUBE IV
AN"; AT 8,10;"BY J.LONSDALE"; AT
 15,12;"~O~ UP"; AT 16,12;"~Z~ D
OWN"; AT 17,12;"~I~ LEFT"; AT 18
,12;"~P~ RIGHT"
 8510 READ A: IF A=99 THEN RESTO
RE 9100: PAUSE 1000: GO TO 8510

 8515 IF INKEY$ <> "" THEN GO
TO 8600
 8520 IF A >= 100 THEN LET A=A-1
00: BEEP .4,A: GO TO 8510
 8530 BEEP .2,A
 8550 GO TO 8510
 8600 FOR N=1 TO 21: POKE 23692,2
55: PRINT ; NEXT N
 8700 RETURN
 9000 DATA 126,129,159,159,159,15
9,159,126
 9005 DATA 0,0,0,0,0,0,0,0
 9010 DATA 31,32,39,39,39,39,39,3
1
 9015 DATA 128,64,192,192,192,192
,192,128
 9020 DATA 7,8,9,9,9,9,9,7
 9025 DATA 224,16,240,240,240,240
,240,224
 9030 DATA 1,2,2,2,2,2,2,1
 9035 DATA 248,4,124,124,124,124,
124,248
 9040 DATA 1,2,4,8,144,96,96,144

 9045 DATA 0,60,126,201,235,255,1
26,60
 9050 DATA 0,60,126,147,219,255,1
26,60
 9100 DATA 109,116,16,14,12,11,9,
11,12,14,116,16,107,114,14,12,1
1,9,7,9,11,12,114,114
 9110 DATA 109,116,16,14,12,11,9,
11,12,14,116,12,14,16,14,112,14,
12,111,112,109,109,99
 9999 SAVE "ICE CUBES" LINE 1: PR
INT "SWAP LEADS:REWIND TAPE":"PR
ESSPLAY TO VERIFY": VERIFY "": P
RINT "OK": PAUSE 200: RUN
```

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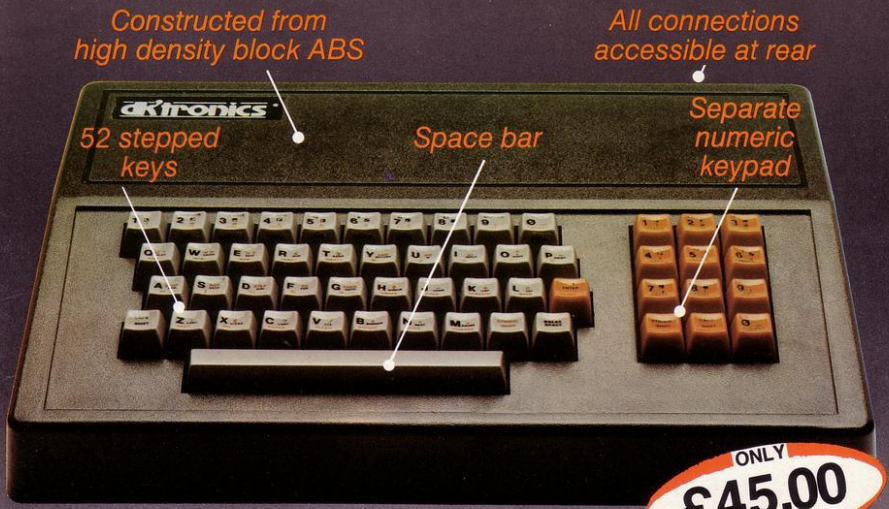

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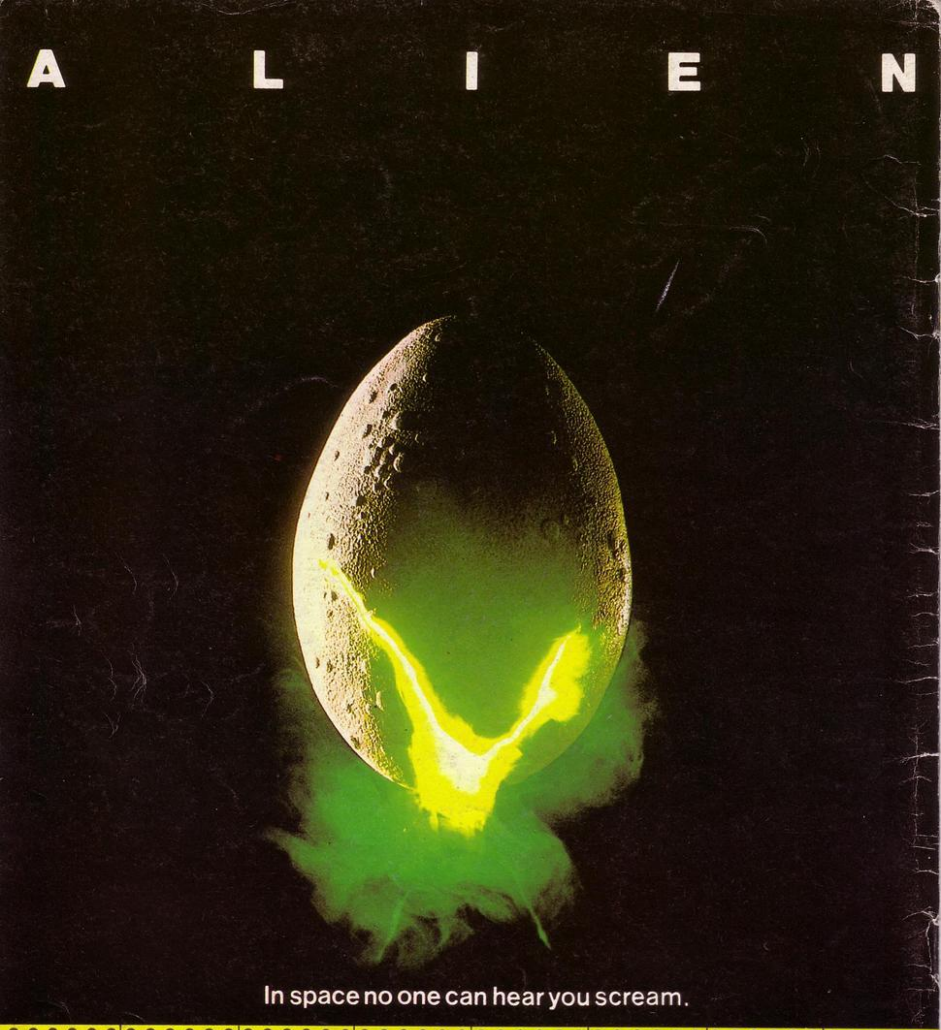

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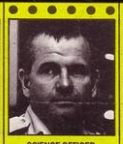

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